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The purpose of this thesis was to design, conduct, and analyze a C3 conflict simulation that examined the effects of information delay on mission effectiveness. In the experiment the outcomes of student play and computer play of the Tactical Tic-Tac-Toe(T4) simulation were analyzed to determine whether the delay of certain types of information affected mission performance; and, whether computer play results were similar to student play of the same scenarios. Analysis of the experimental data provided strong evidence that in both automated and student play, delay in information about the direct opponent adversely affected mission effectiveness. The comparison between student play and automated play was not quite as clear. For the control teams, which did not experience information delay, automated play very closely resembled student play. But, in the case of the treatment teams, which were subjected to information delay, the evidence was not strong enough to make definitive conclusions.

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MODELING C3: THE EFFECTS OF INFORMATION DELAY IN TACTICAL TIC-TAC-TOE (T4)

by

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Submitted in partial fulfillment
of the requirements for the degree of

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ABSTRACT

The purpose of this thesis is to design, conduct, and analyze a C3 conflict simulation that examines the effect of information delay on mission effectiveness. In the experiment the outcomes of student play and computer play of the Tactical Tic-Tac-Toe (T4) simulation are analyzed to determine whether the delay of certain types of information affects mission performance; and, whether computer play results are similar to student play of the same scenarios. Analysis of the experimental data provides strong evidence that in both automated and student play, delay in information about the direct opponent adversely affects mission effectiveness. The comparison between student play and automated play is not quite as clear. For the control teams, which do not experience information delay, automated play very closely resembles student play. But, in the case of the treatment teams, which are subjected to information delay, the evidence is not strong enough to make definitive conclusions.

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I. INTRODUCTION

A. BACKGROUND

On today's battlefield a military force must have efficient and effective command and control to accomplish its assigned mission. Upon receipt of the mission, the commander utilizes whatever information is available to decide how to employ the forces. This course of action is transmitted to subordinates for execution. As the battle progresses, the subordinates and others pass updated information to the commander, who adjusts the strategy and issues new instructions to the subordinates as appropriate. Thus, a critical component of effective command and control is the timely exchange of accurate and relevant information.

It is widely accepted that too much information, too little information, and delayed information are all detrimental to mission accomplishment. But, it is not known with certainty what constitutes too much information, too little information, or too long of a delay in information receipt. Nor is it known how these factors vary as the type of mission changes. At this point the command, control, and communication (C3) functions of the force need to be broken down into simpler, more manageable parts to examine the relationship between information and mission accomplishment.

Ideally, this examination would take place in the context of actual combat; but the empirical data available from previous conflicts is typically inadequate to answer the C3 questions at hand, and we cannot impose experiments on commanders when new conflicts do arise.

The alternative is to study the issues within some abstraction of combat. These range in level of personnel involvement from large scale exercises down through wargames to computer simulations. Exercises are the closest to actual combat, but experimental conditions are hard to enforce, and due to exercise costs, an adequate number of replications cannot be conducted. Consequently, wargames and computer simulations are frequently used to study C3 issues.

War games and simulations can be used effectively for the design, training, and employment of major C3 systems.(Sherfey, 1992, p. 2) A war game is a representation of conflict that uses human subjects to make the decisions as the conflict progresses. In simulations, decisions are not made by human subjects, they are made according to predetermined rules and procedures; simulations are often run on computers.(Sherfey, 1992, p. 6)

Neither method is real conflict. They are abstractions of conflict that attempt to duplicate an actual conflict situation. However, since war games and simulations are used in determining system acquisitions and force employments, it is important that they imitate actual C3 interactions as

closely as possible, and that military decision makers be able to evaluate the premises of a simulation when considering its implications in force structuring.

B. PURPOSE

The purpose of this thesis was to design, conduct, and analyze a C3 conflict simulation that examined the effect of information delay on mission effectiveness. In the experiment the outcomes of student-play and machine-play of the Tactical Tic-Tac-Toe (T4) simulation were analyzed to determine whether the delay of certain types of information affected mission performance; and, whether machine-play results were similar to those from student-play of the same scenarios. The objective of the analysis was to provide insight into the types of information that are crucial to mission accomplishment in a simple conflict and to address the prospect of computer emulation of human decisions in the C3 aspects of conflict.

C. APPROACH

The game chosen as the vehicle for the experiment is called Tactical Tic-Tac-Toe (T4). It is a simple war game that can be used to examine the effects of delay of information (move knowledge). It is based on the familiar game of tic-tac-toe. It has many advantages that make it useful for examining factors that may affect C3 in conflict: it is simple to play and understand; it allows the examination

of C3 concepts; and it introduces the student to the design of C3 system evaluation experiments.

The experiment was conducted in two phases. First, students played the semi-automated version of the game under varying combinations of game parameters. Their mission effectiveness was determined by their score. The game parameters were established to determine if information delay affects mission effectiveness. Next, the same game scenarios were played entirely by a computer. The computer simulated the play of four individual players and mission effectiveness was scored. The computer play was compared to the student play to determine if computer play satisfactorily reproduced student play.

D. TACTICAL TIC-TAC-TOE (T4)

T4 was developed by Mr. Gary Porter, a scientist with a civilian research corporation. It is a very simple and easy to learn game based on the familiar game of tic-tac-toe. T4 is played by two two-person teams on a game board that consists of two tic-tac-toe boards placed side by side as shown in Figure 1.

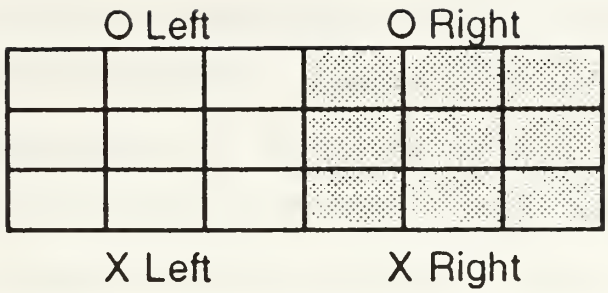


Figure 1. Tactical Tic-Tac-Toe Game Board

Teams are designated X or O, and each team takes one side (left or right) of the game board. The game allows tic-tac-toes to be made on each side of the game board and across the center line between the two halves of the game board. The game is structured to examine the impact of various C3 game parameters on mission effectiveness. Full game play instructions are included in Appendix A.

In T4 the parameters can be altered to examine their effect: information on a player's moves can be delayed to other players; team planning time can be provided or removed; move conflicts can be resolved in a random or set manner; and, team missions can require independent or coordinated play.

T4 allows the delay of players' information about their direct enemy's moves (tactical), information about their partner's moves (communication), and information about their partner's opponent's moves (area). Information can be delayed from zero to nine moves. Additionally, teams can be given

time to plan their strategy before game play, and missions can be selected which require independent action or a coordinated attack with their team member. Outcomes can be examined for the effects of the change in the C3 game parameters.

The game was first played at the Naval Postgraduate School in a manual format. Players made their moves on sheets of paper and gave them to an umpire team which evaluated all moves on a master game board and then scored each game by hand. This was extremely complicated, and the time pressure that resulted when the umpire team administered the game to an entire class led to errors in scoring. To remedy the problem a semi-automated form of the game was developed which automatically generated individual player board views after each move and scored the game.

The semi-automated form of the game was administered to student subjects and is the basis of this thesis. The program allows all elements of mission, delay, and conflict resolution to be entered into a computer-generated master game board. The master game board shows the current status of all moves, without the added delays, to the umpire team.

In the play of the game, each individual player receives a game board on which they make their initial move. Individual player team members turn in their hand-marked moves on their game board sheet to the umpire team. The umpire team then enters the moves onto the master game board. The computer automatically generates new game views for each

player based on their delays and maintains a "true" master version of the game for the umpire team. The updated move sheet is passed out to the team members and play repeats until the game is completed. At the end of play, the computer automatically scores the game. The semi-automated T4 game experiment is covered in detail in Chapter II.

Along with the semi-automated form of the game, a fully automated version was developed in which all four team positions are played by a computer. The computer is programmed to play individual positions according to different strategies which are entered by the umpire. In this way a player position can be given a predisposition to play certain games with particular strategies: defensively; offensively; randomly; or at some point in-between.

The type of strategy is varied by the weighting the umpire gives certain board patterns or block positions. Board patterns are the different combinations of horizonal, vertical, and diagonal tic-tac-toes that can be made on the left or right boards and in the center section across both boards. Block positions are the nine individual move positions on each board. The same game scenarios were used for semi-automated and fully automated game play. The fully automated T4 game experiment is covered in detail in Chapter III.

In examining the results from both types of games, this thesis evaluates two areas of C3 simulation using T4:

- Did the delay of certain types of information affect a team's mission effectiveness?
- Did fully automated game play of the same scenarios produce the same results as student game play?

The conclusions of the analysis are presented in Chapter IV.

II. T4 GAME PLAY BY STUDENTS

A. INTRODUCTION

Tactical Tic-Tac-Toe (T4) is a double game board version of basic tic-tac-toe. It is a simple game of conflict. The automated features of the game allow individual player views of the game to be altered by delaying the display of particular players' moves on the game board. This delay of the move knowledge simulates information delay. Additionally, the set up of the game parameters introduces the design of a C3 system evaluation experiment.

The semi-automated form of T4 was played during eight 2-hour lab sessions of CC-4003 to provide students instruction on the effects of intelligence on game results and to further refine the game. The procedures for the playing the game are provided in Appendix A.

B. EXPERIMENTAL DESIGN

1. Subjects

Test subjects consisted of 22 CC-4003 class members. Each team was composed of two members. Teams were scheduled to randomly play different scenarios and other teams. Teams never played more than two games in succession with any other team. Team members could generally plan their strategy prior to game start, but were not allowed to jointly plan after

their game missions were known. Teams were given introductory game plays to familiarize them with the game prior to actual game play. A team was designated as either Team X or Team O. One team did not receive information delays (delay of move knowledge), and was designated the control team. The other team could receive different types of information delay and was designated the treatment team. Team members were unaware of their designation.

2. Apparatus

The game requires special equipment to play. Two Apple Macintosh computers utilizing system 6.0.5 and two laser printers are required to run the game properly. A paper cutter was required to cut the main game board into four individual user game pieces. This was done to speed the game up. Hypercard version 2.0 is required along with the T4 game software to run and score the game.

The game was played in a room partitioned into four bays: three game bays and one umpire team bay. Two teams of two players each were placed in a bay. Players were provided a scratch sheet with a copy of the game board to record their moves and an actual game board piece that was returned to the umpire team to record each move on the computer. Players marked their moves on their game piece. After a move was marked, the game pieces were retrieved by the umpire team and returned to the umpire bay. The moves were entered into the

computer and a new game sheet was printed. Due to the length of time required to print four separate views of the game, one sheet of all four views was printed and cut with a paper cutter into four individual views. These updated game pieces were returned to the team for the next move. This process continued until the game was completed and the score was calculated by the game software.

3. Procedure

Before the experiment could be designed, hypotheses had to be selected. Many parameters can be tested in the T4 game, but it was felt that a more meaningful experiment could be designed by varying only a few parameters. The initial conjecture was that a team's performance and the knowledge they have of other moves being made are correlated. The second part of that hypothesis is that there are certain types of information that affect a team's performance more than others. Lastly, it was hypothesized that the correlation between types of information delayed and a team's mission may differ; a team has that has a mission that requires close team coordination may require a type of information that is different from that required by a team that has a mission requiring more independent action. With these assumptions in mind, the following experimental hypotheses were developed:

- Teams that have game information delayed will not perform as well as teams with no information delay.

- Teams with coordinated team play will score differently than teams with independent team play when information is delayed.

To evaluate these hypotheses, the following experimental model was assumed:

$$Y_{ijklm} = \mu + TM_i + CM_j + TD_k + A/C_l + (TM*TD)_{ik} + (TM*A/C)_{il} + e_{ijklm}$$

where:

Y_{ijklm} = treatment team's score in replication m of setup ijkl
μ = treatment team's mean score unaffected by parameters
TM_i = deviation from μ due to treatment team having mission i (i has two levels: mission A or mission B)
CM_j = deviation from μ due to control team having mission j (j has two levels: mission A or mission B)
TD_k = deviation from μ due to treatment team experiencing tactical delay at level k (k has two levels: no delay or delay of 1 move)
A/C_l = deviation from μ due to treatment team experiencing area/communication delay at level l (l has two levels: no delay or delay of 1 move)
$(TM*TD)_{ik}$ = interaction effect when treatment team has mission i and tactical delay k
$(TM*A/C)_{il}$ = interaction effect when treatment team has mission i and area/communication delay l
e_{ijklm} = random error for replicate m when other factors are present at levels i, j, k, and l

To test the hypothesis using the model, experimental design parameters were established. Teams were designated as treatment or control teams. A treatment team always played a control team. Control teams always had no delay. No significant difference between teams was assumed. The teams were all given introductory games to familiarize them with game play before the experiment was started.

Teams designated as treatment teams received one of two mission combinations: they could be assigned a mission of victory on the left board and the right board (victory left/right) or a mission of victory on the left or right side of the board and victory in the crossover area of both game boards (victory left/right and crossover). Crossover missions are viewed as requiring more coordinated teamwork to achieve the objective. Within each of these missions, each team member could have no delay; tactical delay of one move; area and communication delay of one move; or tactical, area, and communication delay of one move.

The team score was the chosen indicator of team performance. As discussed above, each team was given two possible missions and was scored one point for each successful completion. Ties were scored as zero. Thus, each team could score either 0, 1, or 2 points per game. There are other alternative measures of performance such as number of tic-tac-toes scored, but they are not examined in this thesis.

When two players chose to move into the same unoccupied game block (caused by intelligence delay), the conflict was randomly resolved by the computer. Feedback was provided to players on their game board which indicated which player received the block. When a player moved into a previously occupied block, the player possessing the block, retained it, and the player trying to move there lost that move.

The teams were allowed to do general game planning before or after the game sessions. Once the game session began and players received their mission, teams were not allowed to plan specific game strategies and team members were physically separated.

Game parameters and opposing teams were randomized to the greatest extent possible. This was done to avoid teams becoming to familiar with a particular game scenario or opposing team and to control other factors such as learning. Layout patterns for team randomization are presented in Appendix B. The entire randomization sequence was not utilized in the experiment; problems with game software and game time resulted in a smaller number of game trials than planned.

Game scenarios were designed to obtain an even distribution of data points for each scenario type. Again, software problems and game times resulted in incomplete repetitions for different game scenarios. A listing of the game scenarios is shown in Table 1.

TABLE 1. GAME SCENARIOS AND COUNTS

GAME	COMBINATION	COUNT
A1	A1	2
A1	A2	6
A1	B3	6
A1	A4	5
B1	A1	3
B1	B2	5
B1	B3	5
B1	B4	4
A1	B1	6
A1	B2	5
A1	B3	6
A1	B4	6
B1	A2	5
B1	A3	5
B1	A4	6
TOTAL		75

C. DATA

The T4 game software stores each round of game moves so that the entire game can be reconstructed move for move. The game records the outcome of the first conflict resolution and scores the game according to tic-tac-toes and mission completion. An example of raw data from the game is presented in Appendix C.

In recording the games some data problems were encountered which altered the initial game design and later affected data analysis. Data problems mostly fell into two areas: lost data due to lock up of the game software and incomplete balancing of game types due to game lock-up and unequal game times. The differences in game times resulted from the randomization of the game play; teams had to wait for all other teams to finish game play to swap opposing teams. This increased game play time as different teams and scenarios required different amounts of time.

In recording the data, the initial game codes were altered to more easily manipulate the data during analysis. During game design, data was coded as follows:

- Mission: A = victory left and victory right
  B = victory left/right and victory crossover
- Delay type: 1 = no delay
  2 = tactical delay only
  3 = area/communication delay only
  4 = tactical and area/communication delay
- Mission score: 0 = no mission completion
  1 = one mission completion
  2 = both missions completed

During statistical data analysis, data was coded differently to make data analysis using Minitab software easier to manipulate:

- Mission: 1 = victory left and victory right
  2 = victory left/right and victory crossover

- Tactical delay: 0 = no delay
  1 = delay of one move
- Area/Comm delay: 0 = no delay
  1 = delay of one move
- Mission score: Same as in game design.

All game data results are presented in Appendix D.

D. RESULTS

To determine the effects of different levels of the parameters in the experimental model, data was analyzed using the General Linear Model (GLM) procedure in Minitab. The GLM is a regression model which does an analysis of variance using unbalanced data (different numbers of readings for different cells of information). Within the experimental model, Y would be the game score. Y is assumed to be an additive combination of a mean game score, μ, and the effects of a specific combination of the parameters on the score. The GLM performs an analysis of variance to evaluate which, if any, parameters cause significant departures from the population mean, μ.

Using the GLM procedure, each parameter was evaluated and the resulting p-values were calculated. Parameters with a p value less than $p=0.05$ were considered significant. The only significant parameter using GLM was the treatment team's tactical delay at $p=0.019$. The entire GLM test is presented in Appendix E.

As the GLM tests assume normally distributed data, a Mann-Whitney test was performed on the tactical delay parameter to observe if a difference could be concluded without assuming a normal distribution. The null hypothesis that the two medians were equal was rejected $p=0.0451$. The results of the Mann-Whitney test are presented in Appendix E.

An evaluation of the correlation between a treatment team's score and their tactical delay was also performed. A correlation of -0.262 was calculated. The results of the correlation are presented in Appendix E.

From the results of the data, it appears that information affects mission performance. Team's with information delay do not score as well as team's with no delay. In particular, tactical information significantly impacts mission accomplishment; tactical delay decreases a team's score. Area/communication information delays do not significantly impact a team's performance. Also, mission types and interactions between parameters do not significantly affect a team's performance.

III. T4 AUTOMATED GAME PLAY

A. INTRODUCTION

The second series of trials was based on automated play. In automated play, games moves are made by a computer according to rules that are programmed into the automated T4 game software. Player positions can be programmed to play differently; a position may be programmed to play offensively, defensively, or with some strategy in between. In automated play, the same scenarios played by the students were played by the computer. The object of the simulation was to observe if the computer play produced results similar to student play. Game procedures are presented in Appendix A.

B. EXPERIMENTAL DESIGN

1. Subjects

The automated play of the game does not use human subjects to play the game. Instead, a computer is used to simulate the moves of a human player. The computer play of the positions can be individually varied to give them a predisposition to play with a particular strategy.

2. Apparatus

An Apple Macintosh computer was used to play the automated version of T4. The software required is Automated T4 and Hypercard version 2.0. To evaluate the results,

outputs from the games were automatically stored in Excel spreadsheet software. This provided easy to read documentation of the game parameters and results.

3. Procedure

In designing the procedure for this second part of the experiment, almost all of the design parameters were established by the student experimental design. The automated game design parameters were expressly kept the same as the student gamed portion of the experiment.

The purpose of this part of the experiment was to evaluate whether, under the same situations, the automated play of the T4 game by a computer was similar to that of the students.

The hypothesis for the experiment was that automated game play of T4 would provide the same results as student game play. To evaluate this hypothesis, the following experimental model was assumed:

$$Y_{ijklm} = \mu + TM_i + CM_j + TD_k + A/C_l + (TM*TD)_{ik} + (TM*A/C)_{il} + e_{ijklm}$$

where:

Y_{ijklm} = treatment team's score in replication m of setup ijkl
μ = treatment team's mean score unaffected by parameters
TM_i = deviation from μ due to treatment team having mission i (i has two levels: mission A or mission B)
CM_j = deviation from μ due to control team having mission j (j has two levels: mission A or mission B)
TD_k = deviation from μ due to treatment team experiencing tactical delay at level k (k has two levels: no delay or delay of 1 move)

A/C_l = deviation from μ due to treatment team experiencing area/communication delay at level l (l has two levels: no delay or delay of 1 move)

$(TM*TD)_{ik}$ = interaction effect when treatment team has mission i and tactical delay k

$(TM*A/C)_{il}$ = interaction effect when treatment team has mission i and area/communication delay l

e_{ijklm} = random error for replicate m when other factors are present at levels i, j, k, and l

In the experimental procedure, as stated before, the game parameters were the same as in the student play of the game. The automated play of T4, however, has an advantage over the student play; student games had very few repetitions, but the automated version allows the game to be played many more times. In the automated play, each game scenario was repeated 30 times. Team planning time and randomization of game scenario presentation were not factors in the automated game play.

Crossover missions were set up always victory left with crossover. This design is equivalent to the student game play of crossover game scenarios. If a victory left with crossover plays a victory left and right opponent, the player faces an equal opponent when compared with a victory right with crossover play against a victory left and right opponent. If the missions are victory left with crossover versus victory left with crossover the mission is equivalent to victory right with crossover versus victory right with crossover. No case of victory left with crossover versus victory right with

crossover was played in the student play of the game and will not be addressed in the automated play of the game.

The team score was the chosen indicator of team performance. Each automated team was given the same scenarios that were presented to the student teams. Each team was given two possible missions and one point was scored for each successful completion. Ties were scored as zero. Thus, each team could score either 0, 1, or 2 points per game. Alternative methods of scoring were not used as it would be conducive to data comparisons with the student played game.

There is one major difference, however, between the automated and student play of the game--in automated play, the computer must be programmed to play each position with a particular strategy in order to evaluate its possible moves. The software allows four individual player positions to be programmed with different game strategies. The strategy is introduced by the preferential weighting of game patterns and board position for each player. The weighting system was developed by Mr. Porter during the development of his automated T4 game software and is covered in the game procedures in Appendix A.

Moves are weighted two ways: by pattern of moves--represented on the main programming board; and by position of move--represented on the small programming diagram board beneath the main board (see Figure 2.).

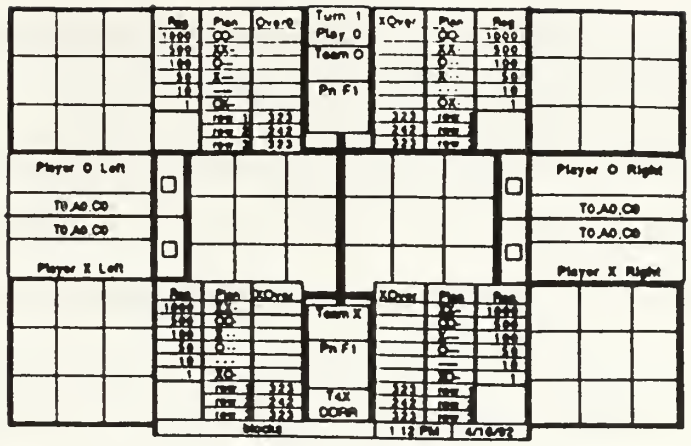


Figure 2. Pattern/Position Programming Board

During the initial set up of the automated game, numbers are assigned to tic-tac-toe patterns and to the nine individual block positions on each side of the game board. Each move is evaluated by the computer which adds the values each block was assigned based on its location in a tic-tac-toe pattern and its location on the game board. The block that has the highest value for that round of the game is chosen for the move. When there is equal weighting of a move based on the pattern, position weights determine the preferential move. If there is equal weighting after consideration of both pattern and position weights, the computer randomly selects one of the moves.

There is a wide latitude in the assignment of weighting values for the individual players game blocks. The weighting values were chosen according to Mr. Porter's suggested values: 1000 represents the preferred move, and

500, 100, 50, 10, and 1, respectively, represent decreasing move preferences.

The game strategies developed for the game were either offensive or defensive. In offensive play, the goal is to score tic-tac-toes rather than block the opponent from scoring a tic-tac-toe. In defensive play, blocking the opponent is preferred to scoring a tic-tac-toe. When a crossover mission was selected for a team, individual player positions were programmed to play either offensively or defensively in the crossover region.

Three different automated player strategies were developed for the automated play of each game scenarios setup: offensive left/right; offensive left with crossover; and, defensive right with crossover. A description and weighting for each automated player strategy is shown below. For ease of explanation, the individual player is assumed to be an O Left player. To use the strategy for an X player, the X's and O's are reversed. To use the strategy for a right player the values are reverse ordered in the position weighting block. In the game set up, the control team which is the team that has no delay, always assumes the position of Team O. In crossover missions the scenario is always victory left and crossover.

- Offensive left/right (O): In this strategy the team has received a mission of victory left and victory right. The individual player is either the left player or the right player. The player's objective is then to score as many tic-tac-toes as possible in the pattern weighting. The position blocks can be weighted so that while trying to

obtain a tic-tac-toe the player can attempt to fill possible crossover blocks in case the opponent's mission involves a crossover mission. As there is no crossover mission, no weighting is entered for crossover patterns.

Pattern weighting:

Regular		Crossover
OO-	1000	
XX-	500	
O--	100	
X--	50	
---	10	
OX-	1	

Position weighting:

Row 1: 323
Row 2: 242
Row 3: 323

- Offensive crossover (OC): In this strategy the team has received a mission of victory left and victory crossover. The individual player is on the side chosen for the mission with the crossover. The player must work to achieve tic-tac-toes both on their side and in the crossover area.

Pattern weighting:

Regular		Crossover	
OO-	1000	00-	1000
XX-	500	XX-	500
O--	100	O--	100
X--	50	X--	50
---	10	---	10
OX-	1	OX-	1

Position weighting:

Row 1: 425
Row 2: 163
Row 3: 425

- Defensive crossover (DC): In this strategy the team has received a mission of victory left and crossover. The player is on the right side and can contribute to mission accomplishment through crossover scoring and by blocking their opponent's right side tic-tac-toes. Here the player must be the right side team player.

Pattern weighting:		Position weighting:
Regular	Crossover	
OO- 500	OO- 500	Row 1: 532
XX- 1000	XX- 1000	Row 2: 541
O-- 50	O-- 50	Row 3: 532
X-- 100	X-- 100	
--- 10	--- 10	
OX- 1	OX- 1	

A defensive left/right player was not utilized. This would describe plays in which a player would not attempt to make any tic-tac-toes; the player would only block moves. In a mission of victory left and right this would be detrimental to mission accomplishment and is, therefore, not deemed a viable player strategy.

The automated player strategies used in each game scenario are shown in Table 3. The computer pattern and position game setups are presented in Appendix F.

TABLE 3. AUTOMATED PLAYER STRATEGIES

GAME COMBINATION		PLAYERS OL	OR	XL	XR
A1	A1	O	O	O	O
A1	A2	O	O	O	O
A1	A3	O	O	O	O
A1	A4	O	O	O	O
B1	B1	OC	DC	OC	DC
B1	B2	OC	DC	OC	DC
B1	B3	OC	DC	OC	DC
B1	B4	OC	DC	OC	DC
A1	B1	O	O	OC	DC
A1	B2	O	O	OC	DC
A1	B3	O	O	OC	DC
A1	B4	O	O	OC	DC
B1	A1	OC	DC	O	O
B1	A2	OC	DC	O	O
B1	A3	OC	DC	O	O
B1	A4	OC	DC	O	O

Table coding:
A = mission of victory left and victory right
B = mission of victory left/right and victory crossover
1 = no delays
2 = tactical delay of one move (direct opponent's moves)
3 = area and communication delay of one move (partner's moves and partner's opponent's moves)
4 = tactical, area and communication delay of one move
O = offensive left/right player strategy
OC = offensive with crossover player strategy
DC = defensive with crossover player strategy

C. DATA

There were no data problems noted in the automated game play. The data was coded like the student game scenarios.

During game play the computer automatically placed the game results in an Excel spreadsheet file. The data obtained from automated play of the game is presented in Appendix G.

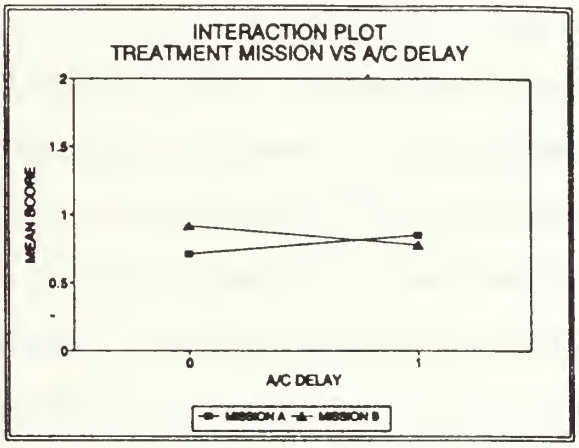
D. RESULTS

Like the student data, the automated data was analyzed using the General Linear Model(GLM) procedure in Minitab. Each parameter was evaluated to determine which, if any, parameters caused a significant departure from the population mean, μ. Those parameters with a p-value of less than 0.05 were considered significant.

Using the GLM procedure, tactical delay had a p-value of 0.0 which was less than 0.05. Therefore, tactical delay exhibited a significant effect on mission effectiveness in the automated game. Additionally, an interaction effect between treatment team's mission and area/communication delay was significant at $p=0.015$. The GLM calculations are presented in Appendix H.

As the GLM tests assume a normal distribution, the Mann-Whitney test was performed on the tactical delay parameter to observe if a difference could be concluded without assuming a normal distribution. The null hypothesis that the two medians were equal was rejected ($p=0.00$). The Mann-Whitney test calculations are presented in Appendix H. The significance of the interaction effect between treatment team mission and area/communication delay was an outcome not observed in the

effect between treatment team mission and area/communication delay was an outcome not observed in the student play of the game. To evaluate the interaction, an interaction plot was drawn of the means of each parameter combination: mission type A with tactical delay; mission type A with no tactical delay; mission type B with tactical delay; and mission type B with no tactical delay. From the plot, shown as Graph 1 below, it can be observed that if a team had mission A (which was victory left and victory right), mission effectiveness was slightly higher with tactical delay; if a team had mission B (which was victory left and victory crossover), mission effectiveness was slightly lower.



Graph 1.

Lastly, the tactical delay and interaction effects were correlated with the treatment team's score to determine if the effect was positive or negative. The correlation between treatment team's tactical delay and treatment team's score was -0.192. The correlation between treatment team's mission and

which is due to the interaction of the mission types which negate each other's effects.

The analysis of the data to this point has evaluated what parameter effects were observed in automated play of the T4 game. The analysis indicates that tactical delay decreases a team's mission effectiveness; and, that there is an interaction effect between the treatment team's mission and their area/communication delay.

Next the data was analyzed to determine if automated T4 game play emulates student play of T4. The data was first evaluated at the broad overview level by comparing automated and student mean scores. This was done to determine whether the overall game means were similar.

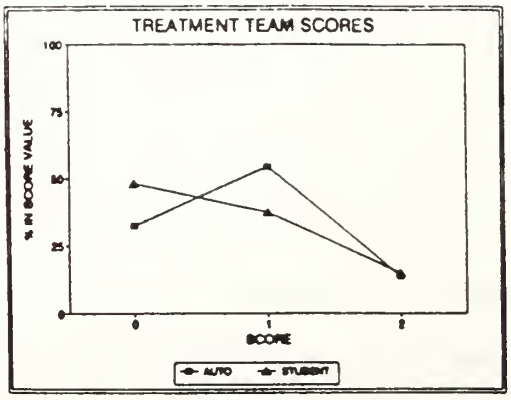
Using the Minitab two-sample T-test, the overall mean of data across all scenarios, treatment and control, in the automated game was found and compared with the overall mean of data across all scenarios, treatment and control, from the student played game. In the two sample T-test, the student game mean (n=150) was 0.847 with a standard deviation of 0.721; the automated game mean (n=960) was 0.972 with a standard deviation of 0.682. The 95 percent confidence interval for the automated mean minus the student mean was (0.001, 0.249). The confidence interval does not include 0.0, therefore, it can be rejected that the two means are the same (p=0.048). The entire calculation is presented in Appendix H.

As the overall means were not similar, the means of the treatment and control teams were evaluated separately. Automated and student means within each team type, treatment and control, were compared. In the treatment teams, the automated mean was 0.812 with a standard deviation of 0.651; the student mean was 0.667 with a standard deviation of 0.723. A two sample T-test was performed, and the 95% confidence interval was calculated to be (-0.030, 0.322). The confidence interval includes 0.0 for the difference of the means, therefore it cannot be rejected that the two means are the same. However, the p=0.10 is very close to the 0.05 level and is viewed to be somewhat borderline. In the control teams, the automated mean was 1.131 with a standard deviation of 0.676; the student mean was 1.027 with a standard deviation of 0.677. A two sample T-test was performed and the 95% confidence interval was calculated to be (-0.062, 0.271). The confidence interval includes 0.0 for the difference of the means, therefore it cannot be rejected that the two control means are the same (p=0.22). The calculations are presented in Appendix H.

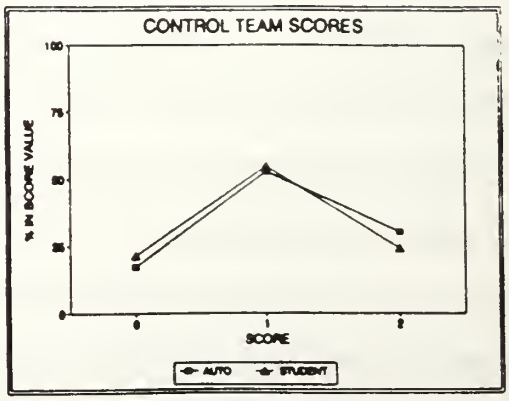
To evaluate the data a little deeper, a Chi-square test was then performed on the automated and student data of each team type (treatment or control) to evaluate whether the distributions were similar. In the Chi-square test of the treatment team scores, the Chi-square value obtained was 8.253 which is very significant at p=0.0161. The Chi-square test of

the control team scores resulted in a Chi-square value of 1.562 which is not significant at p=0.4579. The large Chi-square value from the treatment team indicates that the automated and student distributions are dissimilar. The control team distributions have a very small Chi-square value indicating that the automated and student distributions are very similar. The Chi-square results do not confirm the results of the T-test on the treatment team scores, but the p-value of 0.10 had forewarned of the possibility of seeing a different result in other tests. In the Chi-square test of the control data, the results did confirm the T-test outcome. The Chi-square calculations are presented in Appendix H.

As there was some difference in the outcomes of the T-tests of the means and the Chi-square tests, the score distribution patterns were graphed to evaluate their similarities or differences. Graphs 2 and 3 show that the distribution patterns agreed with the T-test and Chi-square test--the treatment team distributions appear dissimilar and the control team distributions similar.



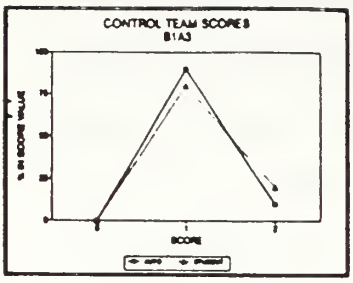
Graph 2.



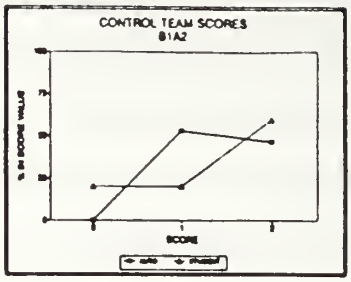
Graph 3.

As both the means and score distributions gave differing results at the overview level, the data was further broken out to examine the scoring distributions of automated and student games within individual game scenarios. Using Minitab, the data was placed by scenario in tables with counts for each game that achieved a particular mission effectiveness score; percentages were calculated for each score value. The percentage calculations are presented in Appendix I.

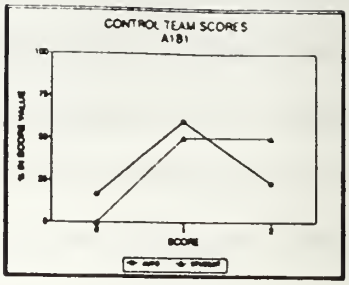
These percentages were then graphed to see if the automated and student data produced similar score patterns. The resulting graphs produced a mixture of distributions that were similar, dissimilar, and ambiguous. Graph 4 represents a distribution in which patterns were identified as similar. Graph 5 represents a distribution in which patterns were identified as dissimilar. Graph 6 represents a distribution in which patterns were ambiguous. In reviewing all of the scoring patterns for each individual game scenario, the graphs do not provide conclusive evidence to support the similarity or difference of automated and student scoring patterns. The graphs of all the distributions are presented in Appendix J.



Graph 4.



Graph 5.



Graph 6.

In reviewing the different analyses of the data, it appears that delay of tactical information resulted in a significant negative effect on both student and automated team mission effectiveness. Additionally, the automated play exhibits a significant interaction effect between a treatment team's mission and their area/communication delay on mission effectiveness. This could be because the student sample size was too small to exhibit this effect or that the automated game strategy programming produced this effect.

When examining the question of whether the automated T4 game emulated student play, there is not conclusive evidence to support the hypothesis. Again, this could be a result of the small student sample size or of the automated game programming. As currently programmed for this experiment, the automated play does produce similar means and score distribution patterns in many scenarios, however the

differences between the game results prevents the conclusion that the two games are satisfactorily similar.

IV. CONCLUSIONS

A. SUMMARY

The comparison of student and automated play of the T4 game in this experiment has produced the following results:

- Delay of tactical information results in a significant negative effect on student and automated team mission effectiveness.
- Automated play was similar to student play when teams had no information delay. When information delay was imposed on a team, there was not significant evidence to conclude that automated play did or did not satisfactorily emulate student play.

Both the automated and student games illustrated an effect of tactical intelligence delay on mission effectiveness. The differences noted between student results and automated results was possibly due to the small student sample size which did not provide enough data to witness significant patterns of play consistency, and by the automated strategy programming. The T4 game is an excellent vehicle for introducing the design of a C3 system evaluation. Given more consistent student data, it is probable that the automated strategies can be programmed to more closely emulate student results and more conclusive results obtained on the effects of C3 parameters on mission effectiveness.

B. RECOMMENDATIONS

In playing both games, it became evident that small problems in the game software needed to be fixed to facilitate game play and prevent loss of data. Additionally, as the game parameters were limited to focus on information delay, there remain vast, unexplored combinations of game parameters for further examination.

Both games had numerous hardware and software dependent features about them. The games must be run on Apple Macintosh computers with 4MB of RAM or higher. The computers must utilize system 6.0.5/6.0.7. To run the T4 software, Hypercard version 2.0 is required. These requirements restrict the use of the program. To obtain wider and easier use of T4, the program should be offered in an IBM compatible format and upgraded to utilize the current Macintosh system 7.0.

Although both experiments ran well, the semi-automated version occasionally froze up. It was not clear why this occurred and the correction of this problem would prevent the loss of experimental data. There were no noticeable problems that occurred in the automated play of the game.

The semi-automated version of the game was a small improvement over the manual version of the past in terms of number of runs. Number of runs, however, does not address the pressure or frustration encountered by the umpire team in the manual version; here, the semi-automated version shows a vast improvement. The umpire team in the semi-automated version

had no worries about scoring the game. This enabled the team to concentrate on the game play and the mechanics of moving all the teams and move sheets. The next step in the development of the game should be to design the student game for play on a computer network. This would allow the game board views to be quickly transmitted to each player which would speed up game play and eliminate the large amounts of paper used playing the game in the semi-automated form.

The fully automated version of the game should be used as an introductory experiment for C3 students. The game allows students to independently design and run a C3 system evaluation. This increased involvement provides a direct encounter with the complexity involved in a seemingly simple C3 system evaluation.

There are numerous game set ups that can be used in future plays of the game. A more indicative measure of performance could be the number of tic-tac-toes each side scores rather than just the mission accomplishment score. Mission accomplishment scores are very discrete and do not show any graduated changes in performance and negates the effect of mission accomplishment in ties. Tic-tac-toes are more numerous and may show a more marked trend when evaluating the effects of parameter changes. Another option is to develop a measure of performance that is a weighted combination of tic-tac-toe and mission accomplishment scores.

Future games could increase the delays to see if this more clearly defines the effects of information delays. Planning strategies, missions, information types, game sequences, could all be examined for their affects on a team's effectiveness.

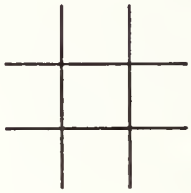
The T4 games provide a multitude of experimental options that should be examined further to gain experimental design experience in C3 system evaluations and to further illustrate the effects of various C3 parameters on mission effectiveness.

APPENDIX A

T^4 (TACTICAL T^3)

The T^4 game used in the OS4602 course last fall was derived from T^3 (Tic Tac Toe). This paper describes the evolution of the T^4 game, its variants and its potential use as a simple, but rich experimental testbed for future OS4602 experiments. Also provided is a discussion of a computer based aid for use by the controllers of the experiment. Use of the aid will result in more accurate results and faster (more) trials.

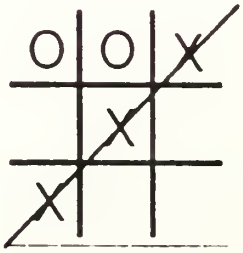
T^3 (TIC TAC TOE) REVIEW



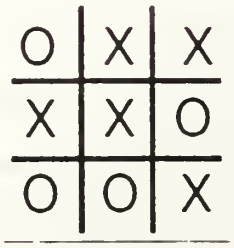
Rules:

- 2 Players (X and O)
- Alternate Turns (X plays first)
- First player to get 3 in a row (TTT) wins:
  - Horizontal
  - Vertical
  - Diagonal
- Ties (Cats Games) are possible

Examples:



Score: X Wins



Score: Tie

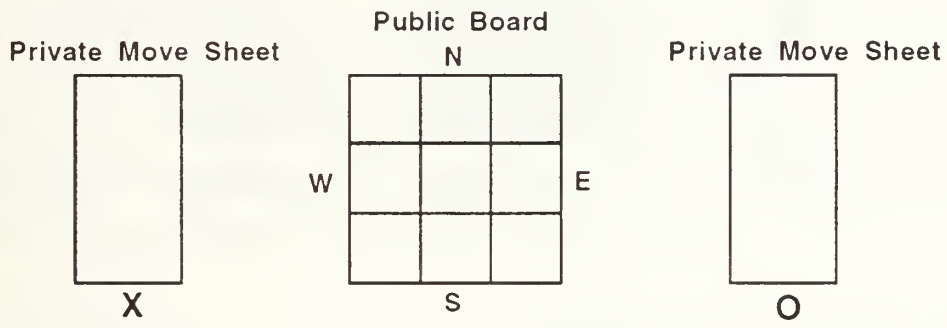
T^4 BASELINE

The T^4 baseline game is like T^3 except for the following:

• **Simultaneous moves**: Both players choose their moves in secret and then announce them simultaneously.

• **Conflict resolution**: The simultaneous move rule means that two players can move into the same cell on the same move. A coin is used to resolve the conflict. The winner of the coin toss is awarded the move. The loser is not allowed to make an alternate move; thus losing a turn.

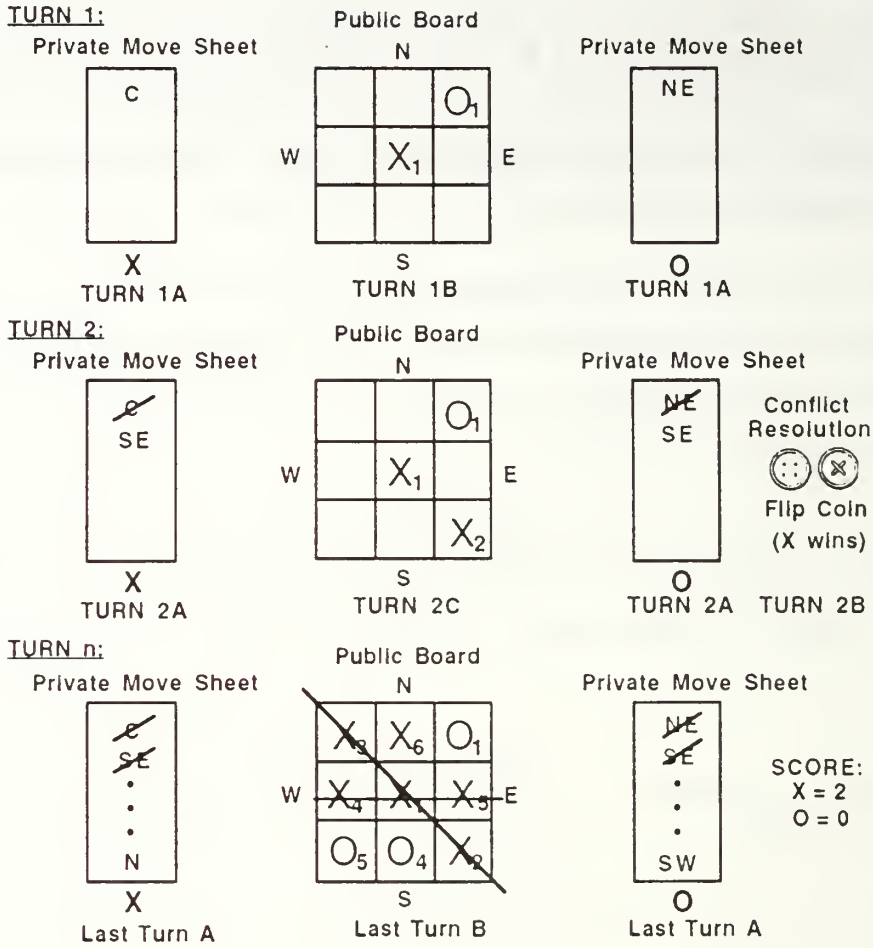
• **Scoring**: The player with the most TTTs wins (not the first TTT). Therefore the maximum score is 8 and the minimum score is 0. Although the Pr(8 TTTs) is about 1 in 20,000,000 (about the same odds as winning the Lotto).



Sequence of Play:

1. Write move on private move sheet.
2. Simultaneously announce moves.
3. Resolve conflicts.
4. Post on public board.

T^4 Baseline Example:



T^4 WITH INTELLIGENCE DELAY

The intelligence delay game is like the T^4 baseline game except an enemy detection delay factor is introduced. A player's knowledge of own moves is always real time, however the player's knowledge of the enemy's current move may be kept secret for one or more turns depending on the game configuration selected before game start. For example, assume player X is configured to play a one turn intelligence delay game and further assume that two moves for both players have already occurred. Then Player X knows of own moves (X_1 and X_2) but is only provided player O's first move (O_1). The configurations assigned to each player may be different. In the above example, player O might have been assigned no intelligence delay and therefore would know of all four moves (X_1, X_2, O_1 and O_2).

Games with intelligence time delays can result in cases where a rational player will move into a cell already occupied by the enemy (but because of the delay factor, the player is unaware of the enemy's location). The conflict is resolved by awarding the move to the player first occupying the square (LIFO). Players are notified of the conflict and of the resolution on a real time basis. T^4 with intelligence delays requires maintaining a private game board for each player and either an umpire or opponents who are good sports.

DOUBLE BOARD T^4 BASELINE

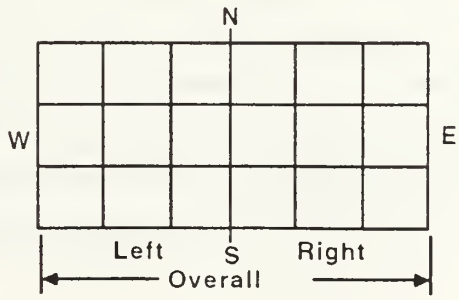
This version uses two standard 3 X 3 cell T^3 boards placed side-by-side designated **left** and **right** game boards. Thus, the total game board is 3 X 6 cells. This game is like the T^4 baseline game except:

- **4 Simultaneous Moves**: Both players announce their left and right moves simultaneously.

- **Crossover Scores**: A crossover score is a TTT that crosses over the center line between the left and right game boards. A crossover score can include TTTTTT (e.g.; X wins the top row of both the left and right game boards. Diagonal crossover TTTs are also possible, but vertical TTTs are not. Multiple TTTs are scored by counting the number of TTTs embedded in a string of multiple TTTs. I.e;

TTT = 1 TTT
TTTT = 2 TTTs
TTTTT = 3 TTTs
TTTTTT = 4 TTTs

The maximum possible score is 26, minimum score is 0.



DOUBLE BOARD T^4 WITH INTELLIGENCE DELAY

This version combines the rules of the single board T^4 intelligence delay game with the double board T^4 baseline game. Again the enemy detection delay configuration can be set to real time (no delay), or a delay of one or more turns. A different delay factor can be chosen for each player, for each side of the board, or in combinations. For example one time delay configuration might allow player X to received real time intelligence on the left side of the board but never receive intelligence on the right side. While during the same game opponent player O receives intelligence delayed by one turn on both sides of the board.

DOUBLE BOARD T^4 WITH MISSIONS

Missions are assigned to achieve an **outcome** (victory or survival) within an **area** of the game board (left, right, crossover, or overall). Victory is achieved by scoring more TTTs than the enemy in the assigned mission area. Survival is achieved by not losing (i.e.; winning or tieing) the assigned mission area. The eight mission assignments are as follows:

LV = Left side victory: Score the most TTTs on the left side.
RV = Right side victory: Score the most TTTs on the right side.
CV = Crossover victory: Score the most crossover TTTs.
OV = Overall victory: Score the highest total TTTs (left, right, and crossovers).

LS = Left side survival: don't lose on the left side.
RS = Right side survival: don't lose on the right side.
CS = Crossover survival: don't lose in the crossover area.
OS = Overall survival: don't lose overall.

Up to four individual missions may be assigned to a player's mission set. Both players can be assigned different mission sets. Scoring is based on successful mission achievement (either by individual missions or by mission set). TTTs are used to decide mission outcome. Notice that non-zero sum games are possible. I.e.; both sides may achieve a degree of success in some game configurations.

DOUBLE BOARD T^4 WITH MISSIONS AND INTELLIGENCE DELAY

A combination of the double board T^4 baseline game with mission assignments (one or more of eight mission areas) and intelligence delay (real time, or delays of one or more turns.

TEAM GAMES

Team games consist of two players per side: One player on a team is assigned the left game board and the other the right. Team games are always played on double game boards with mission assignments. Missions (including mission sets) are assigned by team. I.e.; the players on a team are always assigned the same missions. However different mission sets may be assigned to the opposing team. As a general rule team games, especially combinations of games discussed below, require an umpire: Someone who administers the game to ensure that the appropriate amount of information is provided to all four players. As discussed below, players on the same team may be assigned different delay factors. Thus five private game boards are required: one for each player and the umpire. All players keep their game board secret from opponents and their own partner. The umpire's view of the game represents ground truth and is therefore also kept secret. Players secretly provide their moves to the umpire. The umpire then secretly updates ground truth, resolves conflicts, and then secretly returns the appropriate level of information to each player.

TEAM GAMES WITH INTELLIGENCE DELAY

The intelligence delay factor controls when players are provided the enemy's moves. Intelligence delay factors may be assigned independently of player and game board side. Define **Tactical** intelligence to be enemy position information on the player's side of the board, and **Area** intelligence to be enemy position information on the other side of the board. Then different tactical and area intelligence delay factors may be assigned each of the four players. E.g.; X left may be assigned a tactical intelligence delay factor of 1 turn and an area intelligence delay factor of 2 turns (X_L = T_1, A_2). The players partner (X_L) and the enemies (O_L, O_R) may each be assigned different intelligence delay factors .

TEAM GAMES WITH COMMUNICATIONS DELAYS

This version introduces a communications delay factor between players on the same team (partners). Communications delay controls the timeliness of receiving your partners move information. Like intelligence delay factors, communications delays may be set to real time (no delay) or a delay of one or more turns. Continuing the example, if player X_L is assigned a communications delay of one turn then $X_L = T_1$, A_2, C_1. Each of the four players may be assigned different communications delays.

TEAM GAMES WITH FEEDBACK DELAYS

This version specifies the number of moves each player must make before receiving feedback on enemy and partner locations. Like the three other delay factors the feedback delay can be set from no feedback delay to more than one turn feedback delay. In the no feedback delay configuration, normal feedback is provided after each turn. Where normal means providing the level of information dictated by the other delay factors (tactical intelligence, area intelligence, and communications delays). If the delay factor is greater than one, then multiple moves are required before normal feedback is provided. E.g.; if the feedback delay is set to 2, then the player must make two moves before receiving position information on other players' moves. In this configuration, information when received is current to the second turn (after adjusting for intelligence and communications delays). Each of the four players may be assigned different feedback delays.

TEAM GAMES WITH PLANNING

This version introduces planning constraints between partners. Planning is that part of the game that occurs before the first move is executed. There are three levels of planning. Planning levels assigned to partners must be the same. However the levels assigned opposing teams may be different.

• **Specific scenario planning allowed**. Scenarios are provided and direct conversation is allowed between partners before game start in order to plan the specific mission.

• **General planning allowed**. Team members are assigned and general planning sessions are allowed. Planning if not permitted after the specific game scenario (factors) are assigned.

• **Planning not allowed**. Players are assigned to teams from the player pool. No team conversation is permitted until the end of the game.

EXPERIMENTAL DESIGN COMBINATIONS FOR TEAM GAMES

Six factors each having multiple treatment levels have been introduced. They are

- Tactical Intelligence delay (T = 0, 1, 2, • • • 9) turns,
- Area Intelligence delay (A = 0, 1, 2, • • • 9) turns,
- Communications delay (C= 0, 1, 2, • • • 9) turns,
- Feedback delay (F = 0, 1, 2, • • • 9) turns,
- Planning levels (specific, general, and none = P_s, P_g, and P_n), and
- Mission sets consisting of one to four individual missions. E.g.; team X might be assigned win right and don't lose the crossovers ($X = M_{LV,CS}$)

The levels of each of the five factors may be distributed among players each game as follows:

- Tactical Intelligence delay: <u>unrestricted</u> assignment of levels to players,
- Area Intelligence delay: <u>unrestricted</u> assignment of levels to players,
- Communications delay: <u>unrestricted</u> assignment of levels to players,
- Feedback delay: <u>unrestricted</u> assignment of levels to players,
- Planning levels: The same level must be assigned to <u>partners</u>, and
- Mission assignments: The same mission set must be assigned to <u>partners</u>.

In order to get a feel for the magnitude of the experimental design options assume all factors are limited to three levels (the four delay factors are limited to real time, one turn delay, or no information (level 9) and Missions are limited to one of left victory, right victory, or overall victory then consider the following:

- T_0, T_1, T_9 with 4 players = 24 permutations
- A_0, A_1, A_9 with 4 players = 24 permutations
- C_0, C_1, C_9 with 4 players = 24 permutations

- F_0, F_1, F_9 with 4 players = 24 permutations
- P_s, P_g, P_n with 2 teams = 6 permutations
- M (LV, RV, OV) with 2 teams= 6 permutations

Combining the above six factors and their three levels by players yields a wide spectrum of experimental design opportunities. Allowing more than three levels (e.g.; mission sets from one to four missions may be assigned to the two teams where a mission set consists of combinations of the eight basic missions) would increase the number of permutations significantly.

Experience gained during the last T^4 experiment showed that while game play was fairly uncomplicated, the administration of the game by the controllers was cumbersome, confusing, time consuming, and error prone. A computer based aid for the controllers will improve this facet of the experiment. Using the aid will permit improved accuracy and allow more trials during a given time period. The next section discusses this computer aid in depth.

T4 SIMULATION

MOTIVATION

The initial T4 experiment was conducted as part of the OS4602 course in the fall of 1990. A subset of the students were assigned to the lead group. This group was responsible for the design, conduct, analysis and reporting the results of the experiment. The remainder of the students served as subjects. Each trial required for subjects assigned to two teams. Team O consisted of an O left and right player while team X consisted of a X left and X right player.

LESSONS LEARNED

In retrospect two problem areas were identified. 1.) The scope of the experimental design was overly ambitious given the class time constraints allotted to the lead group. The resulting small number of trials pre-preempted findings that were significant. 2.) Data collection errors were committed by the lead group during the conduct, scoring, and data reduction phases of the experiment. These errors may have led the lead group to reach an erroneous conclusion.

AUTOMATED T4

A automated version of the team T4 game has been developed to assist lead groups conduct more trials while hopefully eliminating the data errors experienced during the first T4 experiment. The automated T4 allows the lead group to configure game files based on the experimental design prior to the conduct of the trials. During the trials the lead group receives private moves from each of the four players and inputs them into the automated T4 display by clicking a mouse on the appropriate cell on the electronic game board. After the four moves are secretly input by the lead group, the program then evaluates each players moves based on the game configuration (for example the amount and type of delay) and then prints a new move sheet for each player containing this filtered information, The individual move sheets are returned to each player the next move cycle begins.

Data for each game is automatically collected. The data includes the game configuration data, a history of each move by player, and game scoring by TTTs, and mission areas. The program also allows

the lead group to write the results of the trials to a file in matrix (spreadsheet) format for further data reduction and analysis.

T4 SIMULATION

Developing a T4 simulation was a natural extension to the automated T4 game. The automated T4 game already contained the software to record legal moves, to collect a wealth of game data, to score the games, and to print the results to a data file. All that was required to complete the T4 simulation was 1.) creation of method to generate controlled game moves based on predefined user specified configurations and 2.) to construct a mechanism to allow multiple replications of these games, once specified without user intervention.

Advantages of T4 Simulation

The advantages of using a T4 simulation include 1.) testing the performance of the automated game, 2.) analyzing relationships between T4 configuration factors such as delays, missions assignments, player tactics, and initial wins, and 3.) permitting player versus computer trials which helps control the game play variables and increases the number of trials (1 human subject can play against 3 computer players instead of three players.

Status of T4 Simulation

The computer versus computer version of the simulation is complete. Item 1.) testing discussed above has been completed. The Item 3.) human versus computer play version is not yet available. Item 2.) analysis of relationships between game configurations factors is the subject of the remainder of this paper.

T4 SIMULATION OVERVIEW

The current version of the T4 simulation allows the user to configure play of a trial including configuration each of the four computer players. Configuration means specifying such items as team mission assignments, delays associated with each player, and player tactics. The user also specifies the number of replications desired for each trial configuration and which data file to save the data collected during the games. Multiple trial configurations may be specified for a given simulation run. For example 30 replications of one game configuration and 30 replications of one or more

variations to this configuration may be specified for a simulation run. Once the user starts the simulation run no further human intervention is required until the replication run is completed. the T4 simulation plays the games according to the predefined user specifications and sends the results to user specified data files. These data files may then be read by most spreadsheets or statistics packages for further data reduction under macro control. The following sections discuss the details of T4 simulation game configuration including creating game plans, specification of multiple factor levels, description of the data that is automatically collected, and use of multiple replications to simulate T4 results.

GAME PLANS

The user specifies the actions of the four computer players by creating a set of three game plans for each. The set of three game plans are the Regular game plan, the Crossover game plan, and the Cell game plan. The game plans enumerate all possible next plays for the player. The user, by assigning point values to these conditions, controls how the computer player plays the game.

The simulation matches the actual condition of the game board with the possible next moves and assigns point values to the empty cells (potential next moves). First the game board is matched against the regular game plan, then the crossover game plan, and finally the cell game plan. the scores of each are accumulated in the empty cells. The cell with the highest point count is chosen for the next move. Ties are randomly broken. A more complete description of each of the three types of game plans is provided below. Also included is an example game in progress to illustrate the concepts.

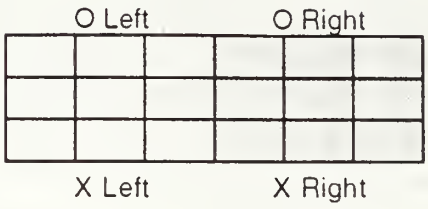
After describing game plans, the other user specified game configuration are discussed followed by the a discussion on the automatic data collection features of the simulation. We will then be prepared to discuss the design of experiment which when executed leads to a better understanding of the relationships of the game configuration variables.

REGULAR GAME PLAN

The regular game plan regulates the automated play of the computer player on the regular (non-crossover) portion of that player's side of the game board. If we assume we are describing Player O Left's game plan then O Left's regular portion of the

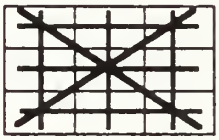
playing board is shown as unshaded in the figure below.

T4 Game Board



The simulation first sequentially "looks" at all eight of the ways that a three cell regular TTT can be scored as shown in the figure below.

Eight Regular TTTs



It first looks at the 3 horizontal TTTs, then the 3 vertical TTTs, then the 2 diagonal TTTs. During each of the eight looks it attempts to match the contents of the three cells in the look with a permutation of one of the codes in the regular game plan.

A regular game plan is a table which enumerates in coded form all possible next moves for a player and the point values assigned by the user to that move. Player O Left's regular game plan with sample values assigned to each condition is shown in the figure below.

Regular Game Plan

Player O Left

OO-	1,000
XX-	500
O--	100
X--	50
---	10
OX-	0

An X or an O in the code means a cell has an X or an O in it. A dash (-) means a cell is blank. As previously discussed, the program attempts to match the 3 cells in the current look with permutations

of the codes in the regular game plan. For example the simulation first looks at the three cells in first row of player O Left's game board and attempts to match the contents with a permutation of the first code "OO-" in the regular game plan. A match occurs if the three examined cells contain "OO-", "O-O", or "-OO". In other words, a match occurs if the three cells contain exactly three X's and a blank in any order. The remaining codes are evaluated in the same manner as shown in the figure below.

Regular Game Plan Definition

Player	O Left	The three cells contain (in any order) exactly:
OO-	1,000	Two O's and one empty cell
XX-	500	Two X's and one empty cell
O - -	100	One O and two empty cells
X - -	50	One X and two empty cells
---	10	Three empty cells
OX-	0	One each O, X, and empty cell

When a match occurs the point value in the second column of the game plan is added to the blank cell. Notice that each code has at least one dash (-) in it, otherwise a next move for that code would not be possible.

The simulation then steps through each of the eight TTT looks, each time assigning the value of the permuted code it matches to the empty cell. Notice that if an empty cell is in the center of the game board then the point value represents the sum of four "looks" (two diagonal, one horizontal, and one vertical). An empty corner cell has three looks and an empty edge cell has two looks.

Similar procedures are used to add the values in the crossover and cell game plans to the empty cells. But first the following example is introduced to illustrated the procedure. The example game is joined in progress and the simulation is evaluating the next move for O left using the regular game plan shown above. Only one side of the game board is used to evaluate the regular game plan: in this case the left side.

O Left's Next move

O Left			O Right		
		X2		X2	
	X1		O2	O1	
	O2	O1		X1	
X Left			X Right		

First the three rows are evaluated. The top row (--X) matches a permutation of (X--) in the regular game plan. Therefore 50 points is assigned to both blank cells in the top row. The middle and bottom rows are evaluated in the same manner resulting in the interim point values as shown in the following figure.

O Left's Next move

O Left			O Right		
50	50	X2		X2	
50	X1	50	O2	O1	
1000	O2	O1		X1	
X Left			X Right		

The same procedures are followed in matching the three vertical columns and the two diagonals. The point values from the regular game plan is added to the values already in the empty cell (empty in the since that an X or O is not in the cell and thus it represents a possible next move). The results of matching and adding the three vertical rows is shown in the figure in the following figure on the left. The point values found from matching the two diagonals is added to the values in the left figure and shown in the right figure shown below.

O Left's Next move

O Left			O Right		
60	50	X2		X2	
60	X1	50	O2	O1	
1010	O2	O1		X1	
X Left			X Right		

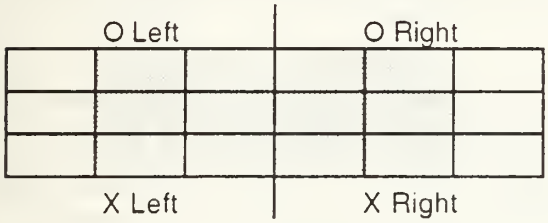
O Left's Next move

O Left			O Right		
60	50	X2		X2	
60	X1	50	O2	O1	
1510	O2	O1		X1	
X Left			X Right		

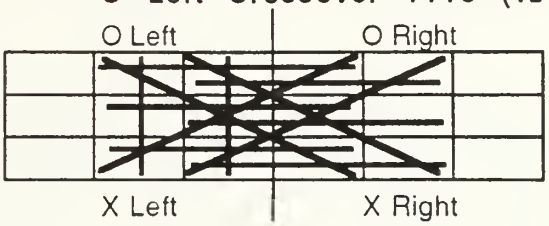
Based on the results of assigning point values to empty cells

based on the regular game plan only the next move selected would be the lower left cell (=1,510). However the Crossover and Cell game plans also contribute to the point values. The crossover area of a T4 team game consists of all the cells in TTTs that cross the centerline as shown in the following figures. The unshaded portion of the figure on the left is crossover area. The twelve crossover TTTs for player O Left are shown on the right.

Crossover TTT Area



O Left Crossover TTTs (12



Notice that while crossover TTTs by definition extend to the right side of the game board, the only points of interest to O Left are those on the left side of the board. Points on the right side of the game board are accumulated using the game plans for the O Right and X Right players. The Crossover game plan used for this player O Left example is shown below.

Crossover Game Plan

OO-	1,000
XX-	500
O - -	100
X - -	50
---	10
OX-	0

The procedures for adding point values to the empty (non X or O) cells after accounting for the topology of the 12 crossover TTTs are the same as those used to calculate the regular game plan points. Each of the three cells in the twelve crossover TTTs are matched with the crossover game plan and empty cells on the left side of the board are assigned point values as before.

The below figure on the left shows the point totals after the points associated with the three left-most horizontal "looks" have been matched and accumulated in the empty cells. The figure on the

right adds the points from the right-most horizontal "looks" to the accumulated totals

O Left's Next move

O Left			O Right		
60	100	X2		X2	
60	X1	50	O2	O1	
1510	O2	O1		X1	
X Left			X Right		

O Left's Next move

O Left			O Right		
60	100	X2		X2	
60	X1	1050	O2	O1	
1510	O2	O1		X1	
X Left			X Right		

The point totals after adding the remainder of the points based on the vertical and diagonal looks are as shown below. Note that the two vertical looks resulted in no points added to cells because they were a permutation of (XO-). And no points were added to empty cells based on the right most two diagonal looks because there weren't any empty cells.

O Left's Next move

O Left			O Right		
60	100	X2		X2	
60	X1	1160	O2	O1	
1510	O2	O1		X1	
X Left			X Right		

Finally the points associated with the Cell Move Plan are added in. The points in the example player O Left Cell move plan shown in the figure below left are simply transferred directly to any empty cells. It may appear that the points assigned to the Cell game plan in this example are too low to have an effect on the outcome. However they may serve as a tie breaker. The resultant final score is shown on the right.

Cell Game Plan

Player O Left		
2	3	5
1	4	5
2	3	5

O Left's Next move

O Left			O Right		
62	103	X2		X2	
61	X1	1165	O2	O1	
1512	O2	O1		X1	
X Left			X Right		

Because the lower left cell has the highest point total it is selected as player O Left's move for turn three.

The same procedures are used with each player's unique set of three game plans to select players O Right, X Left, and X Right next moves.

APPENDIX B

Randomization pattern used in student play of T4.

Games were played across the game session columns and down the game number rows for each session. After each session, data was evaluated to try and adjust the next session so that data points for the different scenarios would be similar. This did not always succeed due to unequal game play times and software problems.

	I		II		III		IV		V		VI	
#	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
1	A2	A1	A4	B1	A1	B1	B4	B1	A2	B1	B3	A1
2	B1	B4	A1	A3	B1	A2	A1	B4	A1	B3	B1	B3
3	B1	A1	B2	B1	A3	B1	B1	B1	B1	A4	B4	A1
4	B3	B1	B1	B2	A1	A2	A1	B2	B3	B1	A1	A2
5	B1	A4	A1	A1	B4	A1	A3	A1	B1	A1	A3	B1
6	A1	B3	A4	A1	B1	B3	A1	A4	B1	B4	B1	A2
7	A2	B1	B1	A3	B3	A1	B2	A1	A2	A1	A1	B1
8	B2	A1	B3	A1	B1	A3	A2	B1	B2	A1	A4	B1
9	A1	A4	B1	B3	A4	A1	A1	B3	A1	A4	A1	A3
10	A3	A1	B4	A1	A1	A1	B1	A4	A3	A1	B2	B1
11	A1	B2	A1	A2	B1	B2	B3	B1	A1	B2	B1	B2
12	B1	B1	A3	B1	B2	B1	B1	A1	B1	B1	A1	A1
13	A1	B4	B1	A2	A1	A3	B1	B4	A1	B4	A4	A1
14	B4	B1	A1	B1	A4	B1	A2	A1	B4	B1	B1	A3
15	A1	B1	B4	B2	B2	A1	A4	B1	B3	A1	A2	B1
16	B1	A2	A1	A4	B1	B4	A1	A3	B1	A3	A1	B3

APPENDIX C

Example of raw game data from student play of T4.

O TTTs	Left	Cross Over	Right	Over All
Across	2	2	2	6
Down	1			1
Diagonal	1	2		3
Total	4	4	2	10

Turn 7
Play 2
Team O
Pn F1
VL VC
•• ••

O SCORE	Left	XOver	Right	O'All
TTTs	4	4	2	10
Victory	1	1	1	1
Survival	1	1	1	1
Mission	1	1		
SCORE	2	—	—	—
ConRes Same		[XO]		
ConRes LIFO	5	—	3	8

Player O Left								Player O Right
		O67	X2	X1	O3	O4	O6	
T0,A0,C0,3,1								T0,A0,C0,1,6
T1,A1,C1,1,1		O34	O23	O1	O15	O24	O56	T9,A9,C9,2,6
Player X Left		O7	O45	O56	X1	X2	X3	Player X Right

X TTTs	Left	Cross Over	Right	Over All
Across			1	1
Down				
Diagonal				
Total			1	1

Team X
Pn F1
VC VR
•• ••
T4X
DDRR

X SCORE	Left	XOver	Right	O'All
TTTs			1	1
Victory				
Survival				
Mission		0	0	
SCORE	0	—	—	—
ConRes Same		[XO]		
ConRes LIFO		—		

def LC CR | 11:09 AM | 9/26/91

APPENDIX D

STUDENT GAME RESULTS

GAME	TRTMISS	TD	A/C	TRTSCORE	CTRLMISS	CTRLSCORE
1	1	1	0	0	1	1
2	2	1	1	0	2	1
3	2	0	0	2	1	1
4	2	0	1	0	2	1
5	1	1	1	0	2	1
6	2	0	1	0	1	1
7	1	1	1	0	2	2
8	1	0	1	2	1	0
9	2	1	0	1	2	0
10	2	1	0	0	2	1
11	1	0	0	0	1	1
12	1	1	1	0	1	2
13	2	0	1	0	2	1
14	2	1	1	0	1	2
15	1	1	0	0	2	2
16	2	1	0	1	1	1
17	1	1	1	0	1	1
18	2	1	0	1	1	0
19	2	0	0	1	2	0
20	1	1	0	1	1	1
21	1	0	1	2	2	1
22	2	1	0	2	2	0
23	2	1	1	1	1	1
24	2	0	1	0	2	1
25	1	0	1	0	2	1
26	2	1	0	0	2	1
27	2	0	1	0	1	0
28	1	0	1	2	2	1
29	2	1	1	1	1	2
30	2	1	1	0	2	2
31	1	1	0	1	2	1
32	1	0	0	2	2	1
33	1	0	1	2	1	0
34	1	1	1	1	2	1
35	1	0	0	0	2	1
36	1	1	0	0	2	2
37	2	0	1	1	1	0
38	1	0	1	0	2	1
39	1	1	1	0	1	1
40	2	1	1	0	2	2

STUDENT GAME RESULTS (continued)

GAME	TRTMISS	TD	A/C	TRTSCORE	CTRLMISS	CTRLSCORE
41	2	1	1	1	1	2
42	2	0	0	0	2	0
43	2	1	0	0	1	1
44	1	0	1	2	1	0
45	1	0	0	1	1	1
46	2	0	1	2	1	0
47	1	1	1	0	2	2
48	2	0	1	1	2	0
49	1	0	0	0	2	2
50	1	0	1	0	1	1
51	2	0	1	2	2	1
52	1	0	0	1	2	1
53	1	1	1	1	2	1
54	2	1	0	0	2	2
55	1	1	0	0	1	1
56	2	1	0	1	1	1
57	2	1	0	1	1	1
58	2	0	0	1	2	0
59	1	1	0	0	1	1
60	1	1	1	0	2	1
61	1	1	0	0	1	2
62	2	0	1	1	1	1
63	1	0	1	0	2	2
64	2	0	0	1	1	2
65	1	0	1	1	1	1
66	1	1	1	1	1	1
67	1	0	1	1	1	0
68	2	1	1	1	1	1
69	2	1	1	0	2	2
70	2	0	1	1	1	1
71	1	1	0	2	2	0
72	1	1	1	0	1	2
73	1	1	0	1	2	2
74	2	1	1	1	1	1
75	1	1	0	1	1	0

Table coding:

GAME = the game number played in the design sequence
TRTMISS = the treatment team's mission type
TD = the level of tactical delay
A/C = the level of area/communication delay
TRTSCORE = the treatment team's mission score
CTRLMISS = the control team's mission type
CTRLSCORE = the control team's mission score

APPENDIX E

- A GLM was calculated on the different parameters of the student gamed experiment.

```
MTB > GLM C6=C3 C4 C5 C7  C3*C4 C3*C5


Factor    Levels Values
TRTMISS        2      1      2
TD             2      0      1
A/C            2      0      1
OPPMISS        2      1      2

Analysis of Variance for TRTSCORE

Source         DF     Seq SS     Adj SS     Adj MS       F
P
TRTMISS         1     0.0534     0.0394     0.0394    0.08
0.780
TD              1     2.6452     2.9227     2.9227    5.82
0.019
A/C             1     0.1920     0.2711     0.2711    0.54
0.465
OPPMISS         1     0.8771     0.9038     0.9038    1.80
0.184
TRTMISS*TD      1     0.4443     0.3166     0.3166    0.63
0.430
TRTMISS*A/C     1     0.3087     0.3087     0.3087    0.61
0.436
Error          68    34.1459    34.1459     0.5021
Total          74    38.6667
```

```
Term              Coeff     Stdev  t-value      P
Constant        0.70125   0.08371     8.38  0.000
TRTMISS
      1        -0.02346   0.08374    -0.28  0.780
TD
 0              0.20222   0.08382     2.41  0.019
A/C
  0             0.06193   0.08429     0.73  0.465
OPPMISS
      1         0.11035   0.08225     1.34  0.184
TRTMISS*TD
      1  0      0.06647   0.08372     0.79  0.430
TRTMISS*A/C
      1   0    -0.06596   0.08412    -0.78  0.436

Unusual Observations for TRTSCORE

Obs. TRTSCORE       Fit Stdev.Fit  Residual   St.Resid
 22   2.00000   0.60651   0.21565   1.39349      2.06R
 51   2.00000   0.62222   0.21213   1.37778      2.04R
 71   2.00000   0.29471   0.20618   1.70529      2.52R
 R denotes an obs. with a large st. resid.
```

- Mann-Whitney Confidence Interval and Test on student treatment team's score with and without tactical delay.

```
MTB > mann c11 c12
Mann-Whitney Confidence Interval and Test

C11        N =  33     MEDIAN =       1.0000
C12        N =  42     MEDIAN =       0.0000
POINT ESTIMATE FOR ETA1-ETA2 IS      -0.0000
95.1  PCT C.I. FOR ETA1-ETA2 IS (  -0.0000,   0.9999)
W =   1426.0
TEST OF ETA1 = ETA2  VS.  ETA1 N.E. ETA2 IS SIGNIFICANT AT
0.0672.
The test is significant at 0.0451 (adjusted for ties)
```

- The correlation between the treatment team's tactical delay and score was calculated.

```
MTB > CORR C4 C6
Correlation of TD and TRTSCORE = -0.262
```

- Automated pattern and position programming.

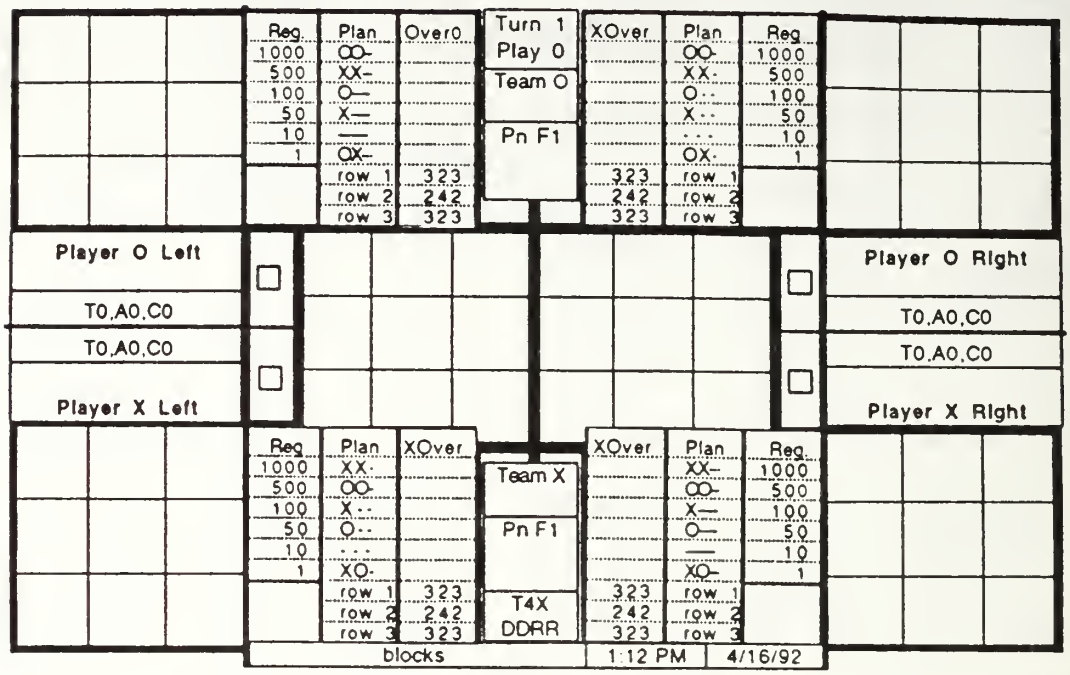


Figure 1. Games A1A1, A1A2, A1A3, A1A4

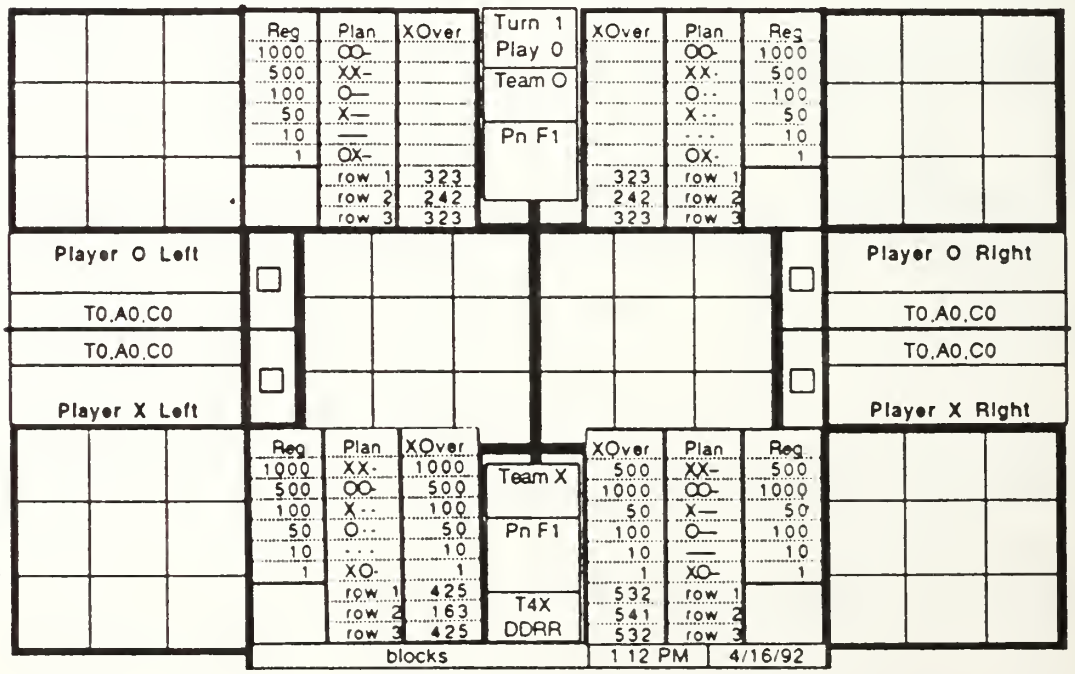


Figure 2. Games A1B1, A1B2, A1B3, A1B4

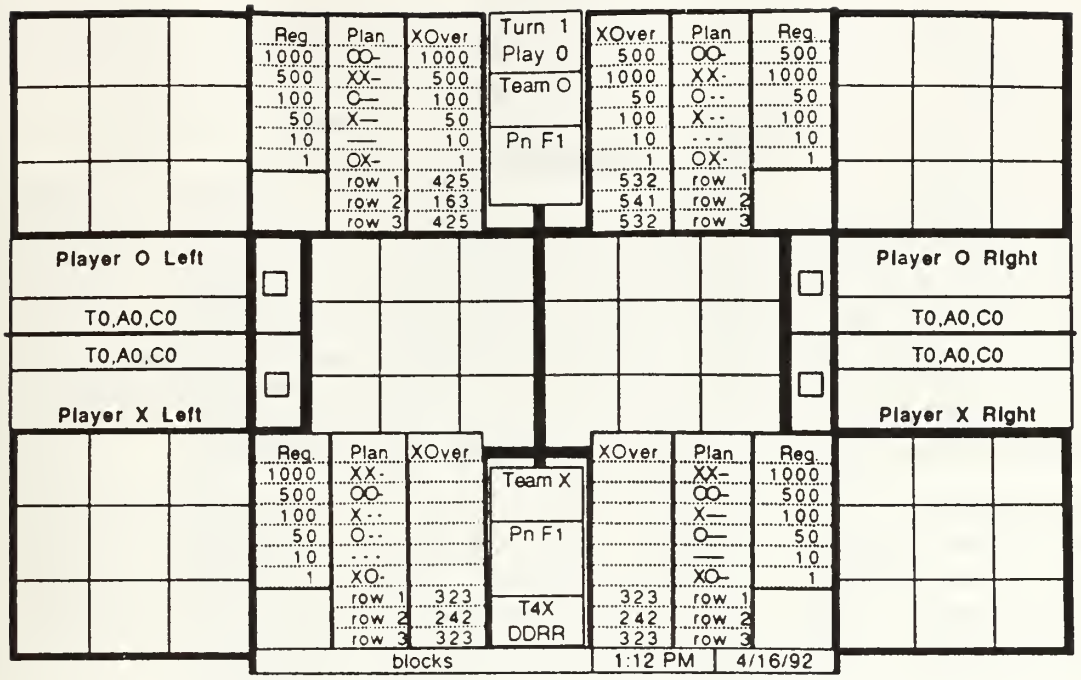


Figure 3. Games B1A1, B1A2, B1A3, B1A4

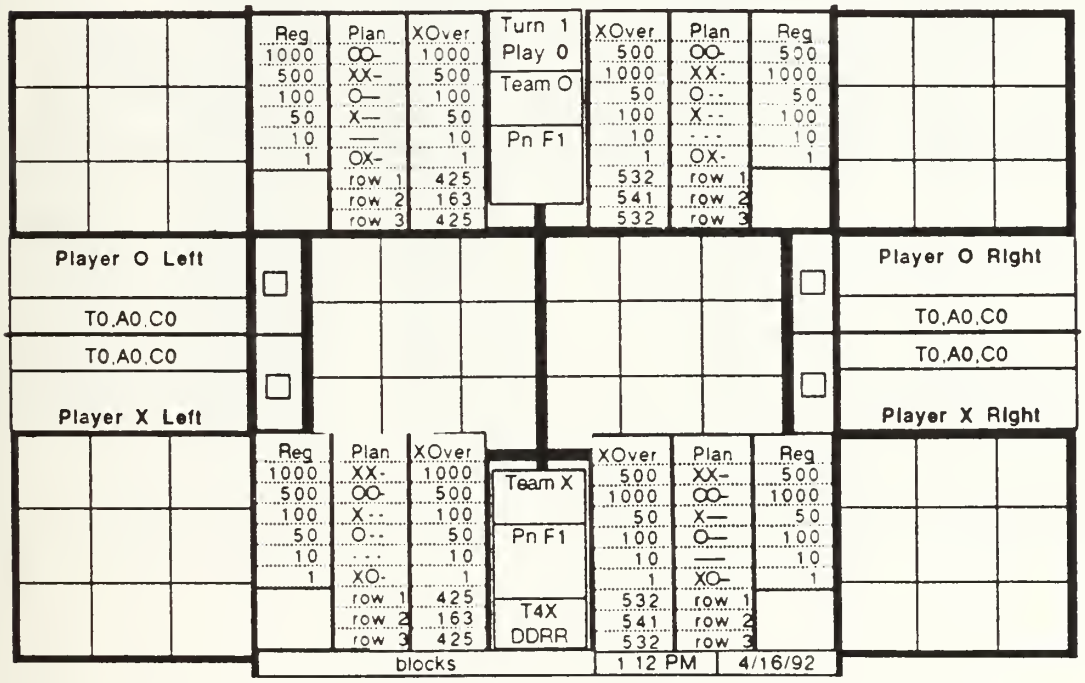


Figure 4. Games B1B1, B1B2, B1B3, B1B4

APPENDIX G

The following pages contain the output of the Automated T4 game in an Excel spreadsheet format.
Each game type is identified at the top of the page. For example the code dfb1b2 represents a data file output in which the game played was b1b2--control team mission, victory left and victory crossover; control team delay, none; treatment team mission victory left/victory crossover; treatment team delay, tactical delay of one move.

Each game has eleven pages of data. On the third page of every game type will appear two score total columns--one for the O team and one for the X team. The cell after the last entry of each column contains the total sum of the scores. The cell below the sum contains the mean score; and the last cell contains the standard deviation of the mean.

Game coding:

A = mission of victory left and victory right
B = mission of victory left and victory crossover
1 = no delays
2 = tactical delay of one move (direct opponent's moves)
3 = area and communication delay of one move (partner's moves and partner's opponent's moves)
4 = tactical, area and communication delay of one move

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1a1 [DDR	4/8/92	11:15 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:18 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:20 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:23 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:26 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:29 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:31 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:34 AM	7	VL	vr
gma1a1 [DDR	4/8/92	11:37 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:40 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:42 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:45 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:48 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:51 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:53 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:56 AM	8	VL	vr
gma1a1 [DDR	4/8/92	11:59 AM	7	VL	vr
gma1a1 [DDR	4/8/92	12:01 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:04 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:06 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:09 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:12 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:14 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:16 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:19 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:22 PM	7	VL	vr
gma1a1 [DDR	4/8/92	12:25 PM	9	VL	vr
gma1a1 [DDR	4/8/92	12:28 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:30 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:33 PM	7	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	2	0
0	0	0	0	1	1
0	0	0	0	2	0
0	0	0	0	2	0
0	0	0	0	2	0
0	0	0	0	0	1
0	0	0	0	1	0
0	0	0	0	0	2
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	2	0
0	0	0	0	2	0
0	0	0	0	0	1
0	0	0	0	0	2
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	2	0
0	0	0	0	2	0
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	0	2
0	0	0	0	1	1
0	0	0	0	0	2
				25	21
				0.83333333	0.7
				0.83390785	0.70221325

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
0			1		
	0			0	
2			0		
	1			1	
	2			0	
2			0		
2			0		
0			1		
1			0		
		0			2
1			0		
		0			1
	1			1	
2			0		
2			0		
	0			1	
	0			2	
		1			0
		0			1
	1			0	
	0			1	
	2			0	
2			0		
	0			1	
	1			1	
		0			1
1			1		
		0			2
		1			1
		0			2

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0		0		1	
0		0		0	
1		1		0	
1		0		0	
1		1		0	
1		1		0	
1		1		0	
0		0		1	
0		1		0	
0		0		1	
1		0		0	
0		0		1	
1		0		0	
1		1		0	
1		1		0	
0		0		1	
0		0		1	
1		0		0	
0		0		0	
1		0		0	
0		0		0	
1		1		0	
1		1		0	
0		0		1	
1		0		0	
0		0		1	
0		1		1	
0		0		1	
0		1		1	
0		0		1	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
0					
0					
0		1	1	1	1
1		1	1		1
0		1		1	1
0		1		1	
0		1	1	1	1
0			1		1
0				1	1
1					
0		1			1
0					
1		1	1		1
0		1	1	1	1
0		1	1	1	1
0					
1					
0		1			
1			1		
0		1			
1			1		1
0		1		1	
0		1		1	1
0					
1		1			
0					
0				1	
1					
0				1	
1					

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
1			1		1
	1		1	1	
				1	1
		1		1	1
				1	1
	1		1	1	
				1	1
1					1
				1	1
1	1	1	1		
				1	1
1	1		1		
		1		1	1
				1	1
				1	1
1	1		1		
1	1	1	1		
	1		1	1	
		1	1	1	1
	1			1	
		1		1	1
	1		1	1	
				1	1
1			1		1
	1	1		1	
1	1		1		
1	1		1		
1	1	1	1		
1	1		1		
1	1	1	1		

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1		1	1	1	1
1		1	1	1	1
1	1				
	1			1	
1	1		1		
1			1		1
1	1				
1	1	1		1	
1	1	1	1		
		1	1	1	1
1	1		1	1	
1		1	1	1	1
	1			1	
1	1				
1	1				
1		1	1	1	1
		1	1	1	1
1			1	1	1
		1		1	1
1	1		1	1	1
	1	1		1	
1			1		1
1	1		1		
1		1	1	1	1
	1		1	1	1
1		1	1	1	1
1		1	1		1
		1	1	1	1
1		1	1		1
		1	1	1	1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
		1	1	2	
1	2	1	4	1	3
3	5	2	10		
3	2		5		
1	1	2	4		1
1		1	2		3
2	4	2	8		
	2	1	3	1	
	1	2	3		1
				1	5
6		1	7		
		1	1	2	1
2	2		4		
1	3	3	7		1
6	6	2	14		
		1	1	1	5
				1	3
1		1	2		3
1	1		2	1	
2		1	3		2
	2		2		
1		1	2		3
2	1	2	5	1	1
	2	1	3	2	2
3			3		1
	1	1	2	2	3
		1	1	3	2
				1	3
		1	1	3	2
				1	1

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	3	4	0	6	0
1	5	4	0	4	0
		9	0	3	0
2	2	7	0	5	0
	1	7	0	5	0
	3	6	0	6	0
		9	0	3	0
1	2	4	0	4	0
	1	8	0	6	0
3	9	4	0	10	0
1	1	11	0	3	0
1	4	5	0	7	0
1	1	8	0	4	0
	1	8	0	4	0
		12	0	2	0
1	7	4	0	8	0
1	5	4	0	6	0
1	4	4	0	4	0
3	4	2	0	8	0
1	3	4	0	4	0
1	1	6	0	6	0
	3	8	0	6	0
	2	7	0	3	0
1	5	3	0	3	0
2	3	7	0	7	0
1	6	3	0	5	0
	5	5	0	11	0
2	6	5	0	9	0
	5	5	0	7	0
2	4	4	0	6	0

O	X	LR
Tot	Tot	First
4	6	[OO]
4	4	[OX]
9	3	[OO]
7	5	[OX]
7	5	[XO]
6	6	[OO]
9	3	[OO]
4	4	[OO]
8	6	[OO]
4	10	[XX]
11	3	[OO]
5	7	[XX]
8	4	[OX]
8	4	[OO]
12	2	[OO]
4	8	[OX]
4	6	[OX]
4	4	[XX]
2	8	[XX]
4	4	[OX]
6	6	[OX]
8	6	[OX]
7	3	[OO]
3	3	[XO]
7	7	[OX]
3	5	[XX]
5	11	[OO]
5	9	[XX]
5	7	[XX]
4	6	[XX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1a1 [DDR	4/8/92	12:36 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:39 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:41 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:44 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:47 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:49 PM	9	VL	vr
gma1a1 [DDR	4/8/92	12:52 PM	8	VL	vr
gma1a1 [DDR	4/8/92	12:55 PM	9	VL	vr
gma1a1 [DDR	4/8/92	12:58 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:01 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:04 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:06 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:09 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:12 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:15 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:18 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:20 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:23 PM	9	VL	vr
gma1a1 [DDR	4/8/92	1:26 PM	9	VL	vr
gma1a1 [DDR	4/8/92	1:29 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:32 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:35 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:37 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:40 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:43 PM	7	VL	vr
gma1a1 [DDR	4/8/92	1:45 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:48 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:51 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:54 PM	8	VL	vr
gma1a1 [DDR	4/8/92	1:57 PM	8	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	100	100	0	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	0	0
0	0	100	100	0	2
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	0	0
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	1	0
0	0	100	100	1	0
0	0	100	100	1	0
0	0	100	100	0	2
0	0	100	100	1	0
				31	15
				1.03333333	0.5
				0.6149479	0.62972353

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
		0			0
	2			0	
1			1		
		1			1
	1			0	
2			0		
	1			1	
		1			1
	1			1	
	1			1	
		1			1
	1			0	
	2			0	
	1			0	
2			0		
1			1		
	2			0	
		0			0
		0			2
		1			1
	1			1	
		0			0
2			0		
	1			0	
	1			1	
	1			0	
1			0		
		1			0
		0			2
	1			0	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0		0		0	
1		1		0	
1		0		0	
1		0		0	
1		0		0	
1		1		0	
0		1		1	
1		0		0	
0		1		1	
1		0		0	
1		0		0	
1		0		0	
1		1		0	
0		1		0	
1		1		0	
0		1		1	
1		1		0	
0		0		0	
0		0		1	
1		0		0	
0		1		1	
0		0		0	
1		1		0	
1		0		0	
0		1		1	
1		0		0	
0		1		0	
1		0		0	
0		0		1	
0		1		0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
0			1		1
0		1	1	1	1
1		1	1		1
1		1	1		1
0		1			1
0		1	1	1	1
0				1	1
1		1	1		1
0			1	1	1
1		1	1		1
1		1	1		
0		1			1
0		1	1	1	1
0				1	1
0		1		1	1
0				1	
0		1	1	1	1
0					
1					
1		1	1		1
0				1	
0			1		1
0		1	1	1	1
0		1	1		1
0				1	
0		1			
0			1	1	1
0		1	1		1
1					
0				1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
				1	1
				1	1
		1		1	1
		1		1	1
				1	1
				1	1
1					1
		1		1	1
1					1
		1		1	1
		1	1	1	1
	1			1	
				1	1
				1	1
	1			1	
1	1				
				1	1
				1	1
1	1	1	1		
		1		1	1
1			1		1
				1	1
				1	1
				1	1
1	1		1		
	1		1	1	
				1	1
				1	1
1		1	1		1
	1			1	

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1	1		1	
1	1				
	1			1	
	1			1	
1	1		1	1	
1	1				
1	1	1	1		
	1			1	
1	1	1			
	1			1	
				1	1
1	1		1	1	
1	1				
1	1	1	1		
1	1		1		
1	1	1	1		1
1	1				
1	1	1	1	1	1
		1	1	1	1
	1			1	
1		1	1		1
1	1	1		1	
1	1				
1	1			1	
1		1	1		1
1			1	1	1
1	1	1			
1	1			1	
		1	1	1	1
1	1	1	1		

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
	1	1	2		
1	3	2	6		1
2	5		7	1	
2	1		3		
2		1	3	1	
2	1	4	7	1	
	2	2	4	1	2
2	1		3		
	4	5	9	2	
3	2		5		
1	2		3		
3		1	4		1
2	6	5	13		
1	1	2	4	1	1
4	1	1	6		3
		2	2	1	1
2	4	2	8	1	1
1			1	1	
	1		1	2	2
2	3		5		1
	2	1	3	2	2
1	1	1	3	1	
2	5	3	10		
5	4	1	10		1
	1	2	3	2	3
2		1	3		4
1	5	2	8	1	
2	3	1	6		
				2	
		4	4		1

X	X	O	O	X	X
's			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	1	8	0	6	0
	1	8	0	4	0
1	2	4	2	4	0
2	2		8	4	0
1	2	7	0	5	0
	1	9	1	2	0
	3	4	5	5	0
2	2	9	0	7	0
	2	3	6	5	0
1	1	4	5	3	0
5	5	5	0	9	0
1	2	2	4	4	0
		1	12	1	0
	2	6	1	5	0
	3	4	5	5	0
	2	5	2	5	0
	2	2	7	1	0
	1	7	0	9	0
2	6	6	0	10	0
1	2	3	5	4	0
	4	3	2	7	0
1	2	6	0	6	0
		8	2	2	0
1	2	4	6	2	0
1	6	4	1	5	0
1	5	4	1	5	0
	1	9	0	5	0
1	1	4	6	4	0
3	5	3	2	9	0
	1	6	3	5	0

O	X	LR
Tot	Tot	First
8	6	[XX]
8	4	[XO]
6	4	[OO]
8	4	[XX]
7	5	[OX]
10	2	[OO]
9	5	[OX]
9	7	[XX]
9	5	[XO]
9	3	[OX]
5	9	[XX]
6	4	[OX]
13	1	[XO]
7	5	[XO]
9	5	[OO]
7	5	[OO]
9	1	[OX]
7	9	[XX]
6	10	[XX]
8	4	[XX]
5	7	[XO]
6	6	[XX]
10	2	[OO]
10	2	[OX]
5	5	[XO]
5	5	[OX]
9	5	[OO]
10	4	[XX]
5	9	[XX]
9	5	[XO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1a1 [DDR	4/8/92	2:00 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:03 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:05 PM	7	VL	vr
gma1a1 [DDR	4/8/92	2:08 PM	7	VL	vr
gma1a1 [DDR	4/8/92	2:10 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:13 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:16 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:19 PM	7	VL	vr
gma1a1 [DDR	4/8/92	2:21 PM	9	VL	vr
gma1a1 [DDR	4/8/92	2:24 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:27 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:30 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:33 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:35 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:38 PM	7	VL	vr
gma1a1 [DDR	4/8/92	2:41 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:43 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:46 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:49 PM	9	VL	vr
gma1a1 [DDR	4/8/92	2:52 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:54 PM	8	VL	vr
gma1a1 [DDR	4/8/92	2:57 PM	7	VL	vr
gma1a1 [DDR	4/8/92	2:59 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:02 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:04 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:07 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:09 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:12 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:14 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:17 PM	8	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	11	11	2	0
0	0	11	11	0	1
0	0	11	11	0	1
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	0	1
0	0	11	11	1	0
0	0	11	11	0	1
0	0	11	11	1	1
0	0	11	11	0	1
0	0	11	11	0	2
0	0	11	11	1	1
0	0	11	11	0	2
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	0	1
0	0	11	11	0	1
0	0	11	11	0	0
0	0	11	11	1	0
0	0	11	11	1	0
0	0	11	11	2	0
0	0	11	11	0	1
0	0	11	11	1	0
0	0	11	11	0	1
0	0	11	11	0	1
0	0	11	11	0	1
0	0	11	11	0	1
0	0	11	11	1	1
0	0	11	11	0	2
0	0	11	11	2	0
				17	24
				0.56666667	0.8
				0.67891055	0.61025715

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	2			0	
0			1		
		0			1
1			0		
	1			1	
		0			1
1			0		
	0			1	
	1			1	
		0			1
0			2		
1			1		
		0			2
	1			1	
1			1		
	0			1	
0			1		
	0			0	
1			0		
1			0		
	2			0	
0			1		
	1			0	
		0			1
		0			1
		0			1
		0			1
1			1		
	0			2	
2			0		

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
1		1		0	
0		0		1	
0		0		1	
1		0		0	
1		0		0	
0		0		1	
0		1		0	
0		0		0	
1		0		0	
0		0		1	
0		0		1	
0		1		1	
0		0		1	
1		0		0	
1		0		0	
0		0		1	
0		0		1	
0		0		0	
0		1		0	
1		0		0	
1		1		0	
0		0		0	
1		0		0	
0		0		1	
0		0		1	
0		0		0	
0		0		1	
1		0		0	
0		0		1	
1		1		0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
0		1	1	1	1
0					
0					
0		1	1		1
1		1	1		1
0					
0				1	1
1			1		1
1		1	1		1
0			1		1
1					
0				1	
1					
1		1			
1		1			
0			1		
0			1		1
0			1		1
0				1	1
0		1			
0		1	1	1	1
1			1		1
0		1			
0					
0			1		1
1			1		
0					
1		1			
1					
0		1	1	1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
				1	1
1	1		1		
1	1		1		
				1	1
		1		1	1
1			1		1
				1	1
		1		1	1
		1		1	1
1					1
1	1	1	1		
1	1		1		
1	1	1	1		
	1	1	1	1	
	1	1	1	1	
1					1
1					1
				1	1
				1	1
	1		1	1	
				1	1
		1		1	1
	1			1	
1	1		1		
1					1
		1	1	1	1
1			1		1
	1	1	1	1	
1	1	1	1		
				1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1				
1		1	1	1	1
1		1	1	1	1
1	1			1	
	1			1	
1		1	1	1	1
1	1	1	1		
	1	1		1	
	1			1	
1	1	1		1	
		1	1	1	1
1		1	1		1
		1	1	1	1
			1	1	1
			1	1	1
1	1	1		1	1
1	1	1		1	
1	1	1		1	
1	1	1	1		
1			1	1	1
1	1				
	1	1		1	
1	1		1	1	1
1		1	1	1	1
1	1	1		1	
		1		1	1
1		1	1	1	1
			1	1	1
		1	1	1	1
1	1				

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
3	5	1	9		
		1	1	1	2
		1	1	2	2
3	3	1	7		
2	5		7		
	1		1	3	1
1		2	3	1	
1	2		3	1	
2	4		6	1	
	2	1	3	1	
				2	2
		2	2	1	3
				2	1
1	2		3		3
3			3		2
	2		2	1	1
	4	1	5	1	
1	3	1	5	1	1
1	2	2	5	1	2
2		1	3		3
3	4	1	8		
1	3		4	1	
1	1	1	3		2
1		1	2	2	4
	3	1	4	2	
1	1		2	1	
	1	1	2	1	1
2			2		2
				3	3
2	1	1	4		

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
		11	0	3	0
1	4	5	0	7	0
1	5	4	0	6	0
1	1	7	0	3	0
1	1	8	0	4	0
	4	5	0	9	0
	1	8	0	6	0
1	2	3	0	5	0
1	2	9	0	5	0
1	2	5	0	7	0
1	5	4	0	10	0
	4	5	0	7	0
1	4	4	0	8	0
4	7	4	0	8	0
2	4	5	0	5	0
	2	8	0	6	0
1	2	4	0	4	0
1	3	7	0	7	0
	3	10	0	6	0
1	4	7	0	3	0
		9	0	3	0
1	2	3	0	3	0
1	3	5	0	5	0
1	7	2	0	6	0
1	3	4	0	6	0
2	3	2	0	6	0
1	3	2	0	4	0
1	3	8	0	6	0
2	8	2	0	10	0
		8	0	6	0

O	X	LR
Tot	Tot	First
11	3	[OX]
5	7	[OO]
4	6	[XX]
7	3	[OO]
8	4	[OX]
5	9	[XX]
8	6	[OO]
3	5	[OX]
9	5	[OX]
5	7	[XX]
4	10	[OO]
5	7	[OO]
4	8	[XX]
4	8	[OX]
5	5	[OO]
8	6	[XO]
4	4	[OO]
7	7	[XO]
10	6	[OO]
7	3	[OO]
9	3	[OX]
3	3	[OO]
5	5	[OX]
2	6	[XX]
4	6	[XX]
2	6	[XX]
2	4	[XX]
8	6	[OO]
2	10	[XO]
8	6	[OO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1a1 [DDR	4/8/92	3:20 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:23 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:25 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:28 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:31 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:33 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:36 PM	9	VL	vr
gma1a1 [DDR	4/8/92	3:39 PM	7	VL	vr
gma1a1 [DDR	4/8/92	3:41 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:44 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:47 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:50 PM	9	VL	vr
gma1a1 [DDR	4/8/92	3:53 PM	9	VL	vr
gma1a1 [DDR	4/8/92	3:56 PM	8	VL	vr
gma1a1 [DDR	4/8/92	3:59 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:01 PM	7	VL	vr
gma1a1 [DDR	4/8/92	4:04 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:06 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:09 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:12 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:15 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:18 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:20 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:23 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:26 PM	7	VL	vr
gma1a1 [DDR	4/8/92	4:28 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:31 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:34 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:37 PM	8	VL	vr
gma1a1 [DDR	4/8/92	4:40 PM	9	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	VL	**
**	**	VL	**	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	0	1
0	0	111	111	1	1
0	0	111	111	0	1
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	1	1
0	0	111	111	0	1
0	0	111	111	0	2
0	0	111	111	1	1
0	0	111	111	0	1
0	0	111	111	1	1
0	0	111	111	1	0
0	0	111	111	1	1
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	1	0
0	0	111	111	0	1
				30	20
				1	0.66666667
				0.64326752	0.54667227

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	1			1	
1			1		
	1			1	
	1			1	
	2			0	
1			0		
		2			0
		1			1
2			0		
		1			1
		0			1
	1			1	
		0			1
		1			1
2			0		
1			0		
	1			1	
		0			1
		0			2
	1			1	
	0			1	
		1			1
1			0		
	1			1	
		1			0
2			0		
	2			0	
	1			1	
	1			0	
0			1		

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0		1		1	
1		0		0	
1		0		0	
0		1		1	
1		1		0	
0		1		0	
1		1		0	
0		1		1	
1		1		0	
1		0		0	
0		0		0	
0		1		1	
0		0		1	
1		0		0	
1		1		0	
1		0		0	
1		0		0	
0		0		0	
0		0		1	
0		1		1	
0		0		0	
0		1		1	
0		1		0	
1		0		0	
0		1		0	
1		1		0	
1		1		0	
1		0		0	
0		1		0	
0		0		1	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
0			1	1	1
1		1	1		1
1		1	1		1
0			1	1	
0		1	1	1	1
0			1	1	1
0		1	1	1	1
0				1	
0		1		1	1
1		1			
1			1		
0			1	1	1
0			1		
1		1	1		1
0		1		1	1
0		1	1		1
1		1			
1			1		1
1					
0			1	1	1
1					
0				1	
0			1	1	1
1		1			
0				1	1
0		1	1	1	1
0		1		1	1
1		1	1		1
0			1	1	1
0					

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
1					1
		1		1	1
		1		1	1
1					1
				1	1
				1	1
				1	1
1			1		1
				1	1
	1	1	1	1	
		1	1	1	1
1					1
1					1
		1		1	1
				1	1
				1	1
	1	1	1	1	
		1		1	1
1	1	1	1		
1					1
		1	1	1	1
1	1		1		
				1	1
	1	1	1	1	
				1	1
				1	1
				1	1
		1		1	1
				1	1
1	1		1		

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1	1			
	1			1	
	1			1	
1	1	1			1
1	1				
1	1	1			
1	1				
1		1	1		1
1	1		1		
			1	1	1
		1		1	1
1	1	1			
1	1	1		1	1
	1			1	
1	1		1		
1	1			1	
			1	1	1
	1	1		1	
		1	1	1	1
1	1	1			
		1	1	1	1
1		1	1		1
1	1	1			
			1	1	1
1	1	1	1		
1	1				
1	1		1		
	1			1	
1	1	1			
1		1	1	1	1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
	1	3	4	2	
2	3		5	1	
4	2		6		
	1	1	2	2	
5	9	2	16		
1	5	2	8	1	
1	1	1	3		
	1	1	2	2	1
2		5	7	1	
2			2		1
1	3		4	1	2
	3	3	6	1	
	2	1	3	1	1
1	4	1	6		
2	1	2	5		1
4	2	1	7		1
1			1		2
1	3		4	1	
				2	1
	2	3	5	2	1
	1		1		1
		1	1	1	1
1	8	5	14	1	
2			2		3
1		1	2	1	
2	6	5	13		
2	1	1	4		1
5	2		7		
1	1	1	3	1	
	1	1	2	2	2

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
	2	4	3	5	0
2	3	2	2	4	0
4	4	6	0	6	0
	2	5	1	6	0
		5	8	1	0
1	2	5	2	3	0
		8	0	6	0
	3	2	1	5	0
	1	2	8		
2	3	1	6	5	0
2	5	5	0	7	0
	1	7	3	6	0
1	3	7	0	9	0
2	2	7	0	7	0
1	2	6	3	5	0
1	2	5	3	2	0
1	3	3	1	6	0
1	2	2	3	5	0
1	4	4	0	8	0
	3	5	2	5	0
1	2	6	0	8	0
	2	2	5	5	0
	1	3	7	2	0
2	5	2	4	6	0
	1	5	1	4	0
		4	7	1	0
	1	3	5	4	0
2	2	3	5	4	0
	1	6	1	5	0
1	5	7	0	9	0

O	X	LR
Tot	Tot	First
7	5	[XO]
4	4	[OO]
6	6	[OX]
6	6	[OX]
13	1	[OX]
7	3	[OO]
8	6	[XX]
3	5	[XX]
10	0	[OO]
7	5	[XX]
5	7	[XX]
10	6	[XO]
7	9	[XX]
7	7	[XX]
9	5	[OO]
8	2	[OO]
4	6	[XO]
5	5	[XX]
4	8	[XX]
7	5	[XO]
6	8	[XO]
7	5	[XX]
10	2	[OO]
6	6	[XO]
6	4	[XX]
11	1	[OO]
8	4	[XO]
8	4	[OX]
7	5	[OX]
7	9	[OO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1b1 [DDR	4/9/92	1:19 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:21 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	1:24 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	1:27 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:29 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:32 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:35 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	1:37 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	1:40 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	1:43 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:45 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	1:48 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	1:51 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	1:53 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:56 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	1:58 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:01 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:04 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	2:07 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:09 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:12 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:15 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:17 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:20 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:23 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	2:26 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:28 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:31 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:34 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	2:37 PM	8	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	0	1
0	0	0	0	1	0
0	0	0	0	1	0
0	0	0	0	1	1
0	0	0	0	1	0
0	0	0	0	0	2
0	0	0	0	2	0
0	0	0	0	0	1
0	0	0	0	2	0
0	0	0	0	1	1
0	0	0	0	0	1
0	0	0	0	0	2
0	0	0	0	1	0
0	0	0	0	0	2
0	0	0	0	0	1
0	0	0	0	0	2
0	0	0	0	2	0
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	0
				22	24
				0.73333333	0.8
				0.63968383	0.66436384

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	0			1	
	1			1	
		1			1
	1			0	
		0			1
	1			1	
		0			1
	1			0	
1			0		
	1			1	
	1			0	
		0			2
2			0		
		0			1
	2			0	
1			1		
	0			1	
	0			2	
	1			0	
		0			2
	0			1	
	0			2	
	2			0	
1			0		
		0			1
	1			1	
	1			1	
	1			1	
1			1		
1			0		

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Mis
ML	MC	MR	MO	ML	MC
0	0			0	1
1	0			0	1
1	0			0	1
0	1			0	0
0	0			0	1
0	1			1	0
0	0			0	1
0	1			0	0
1	0			0	0
1	0			0	1
1	0			0	0
0	0			1	1
1	1			0	0
0	0			0	1
1	1			0	0
1	0			0	1
0	0			0	1
0	0			1	1
1	0			0	0
0	0			1	1
0	0			0	1
0	0			1	1
1	1			0	0
0	1			0	0
0	0			1	0
0	1			1	0
1	0			0	1
1	0			0	1
0	1			1	0
0	1			0	0

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
		1			
		1			
			1		
			1	1	1
				1	
			1	1	1
		1		1	1
		1			1
		1		1	1
		1	1	1	1
				1	
		1	1		1
		1			
		1			1
				1	
		1	1		1
			1		1
				1	
			1	1	1
		1			
		1			
			1	1	
			1	1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
	1		1	1	
	1	1	1	1	
	1	1	1	1	
		1	1	1	1
	1	1	1	1	
1					1
	1			1	
				1	1
				1	1
	1			1	
				1	1
1	1	1	1		
				1	1
	1		1	1	
		1		1	1
	1	1	1	1	
	1		1	1	
1	1		1		
				1	1
1	1	1	1		
	1		1	1	
1	1		1		
				1	1
				1	1
1					1
1					1
	1	1	1	1	
	1	1	1	1	
1			1		1
				1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1		1	1	1	1
			1	1	1
			1	1	1
		1		1	1
		1	1	1	1
1	1	1			
1	1	1	1		1
1	1	1			
1	1		1		
1	1		1	1	
1	1		1		
		1	1	1	1
1	1				
1		1	1		1
	1			1	
			1	1	1
1		1	1	1	1
1		1	1	1	1
1	1		1	1	
		1	1	1	1
1		1	1	1	1
1		1	1		1
1	1			1	
1	1	1		1	
1	1	1	1		1
1	1	1			
			1	1	1
			1	1	1
1		1			1
1	1	1			

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1			1	1	1
2			2		1
1	1		2		4
1	2		3	1	1
1	1		2	1	4
	1	2	3	2	
1		2	3	1	2
1	2	2	5	1	1
1	1	2	4		1
2	1		3		2
1	1	2	4		1
	1		1	2	3
2	4	3	9	1	
1	1	1	3	1	3
3	2		5		1
2	1		3		3
					1
				2	2
1	1		2		1
				2	2
1	1		2	1	2
	1	1	2	1	2
1	2	1	4		1
1	3	1	5	1	
	1	3	4	3	1
1	2	3	6	2	1
2	1		3		4
1	1		2		2
	2	1	3	3	1
1	1	1	3	1	

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
	2	4	0	4	0
2	3	6	0	6	0
2	6	7	0	9	0
2	4	2	0	6	0
1	6	2	0	6	0
	2	7	0	3	0
	3	8	0	8	0
	2	8	0	6	0
	1	9	0	5	0
	2	5	0	3	0
	1	9	0	3	0
1	6	5	0	7	0
	1	10	0	2	0
	4	4	0	4	0
2	3	6	0	4	0
3	6	5	0	7	0
	1	5	0	7	0
	4	7	0	9	0
	1	8	0	4	0
2	6	4	0	10	0
	3	4	0	4	0
	3	7	0	7	0
1	2	7	0	7	0
1	2	7	0	5	0
	4	8	0	8	0
	3	5	0	5	0
1	5	6	0	6	0
2	4	4	0	6	0
	4	8	0	8	0
	1	7	0	7	0

O	X	LR
Tot	Tot	First
4	4	[XO]
6	6	[OX]
7	9	[XX]
2	6	[XO]
2	6	[XX]
7	3	[XO]
8	8	[XX]
8	6	[OX]
9	5	[OO]
5	3	[OX]
9	3	[XO]
5	7	[XX]
10	2	[OO]
4	4	[XX]
6	4	[OX]
5	7	[OO]
5	7	[OX]
7	9	[XO]
8	4	[OX]
4	10	[XX]
4	4	[OX]
7	7	[OX]
7	7	[OX]
7	5	[OO]
8	8	[XX]
5	5	[XO]
6	6	[OX]
4	6	[OX]
8	8	[OO]
7	7	[OO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1b1 [DDR	4/9/92	2:39 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:42 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:44 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	2:47 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:50 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:52 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	2:55 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	2:58 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:00 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:03 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:06 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:09 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:11 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:14 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:16 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:19 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:22 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:24 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:27 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:29 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:32 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:34 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:36 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:39 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	3:42 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	3:45 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	3:48 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	3:51 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	3:53 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	3:56 PM	8	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	1	0
0	0	100	100	1	0
0	0	100	100	0	2
0	0	100	100	1	1
0	0	100	100	0	2
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	0	2
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	0	1
0	0	100	100	0	2
0	0	100	100	2	0
0	0	100	100	1	0
				34	17
				1.13333333	0.56666667
				0.68144539	0.72793204

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	2			0	
1			1		
2			0		
1			0		
	1			1	
2			0		
	1			0	
	1			0	
1			0		
	0			2	
		1			1
		0			2
	1			0	
	2			0	
1			1		
		0			2
1			1		
	2			0	
1			0		
		1			1
		1			1
2			0		
		1			0
	2			0	
	2			0	
1			1		
		0			1
		0			2
	2			0	
	1			0	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Mis
ML	MC	MR	MO	ML	MC
1	1			0	0
1	0			0	1
1	1			0	0
0	1			0	0
1	0			0	1
1	1			0	0
1	0			0	0
0	1			0	0
1	0			0	0
0	0			1	1
1	0			0	1
0	0			1	1
1	0			0	0
1	1			0	0
1	0			0	1
0	0			1	1
1	0			0	1
1	1			0	0
1	0			0	0
1	0			0	1
1	0			0	1
1	1			0	0
1	0			0	0
1	1			0	0
1	1			0	0
0	1			1	0
0	0			0	1
0	0			1	1
1	1			0	0
1	0			0	0

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
		1	1	1	1
		1		1	1
		1	1	1	1
			1	1	1
		1			
		1	1	1	1
		1			1
			1		
		1		1	1
				1	
		1			
		1		1	1
		1	1	1	1
		1		1	1
				1	
		1			
		1	1	1	1
		1		1	1
		1		1	
		1		1	
		1	1	1	1
		1			
		1	1	1	1
		1	1	1	1
			1	1	1
		1	1	1	1
		1		1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
				1	1
	1			1	
				1	1
				1	1
	1	1		1	
				1	1
				1	1
		1		1	1
				1	1
1	1		1		
	1	1	1	1	
1	1		1		
				1	1
				1	1
	1			1	
1	1		1		
	1	1	1	1	
				1	1
				1	1
	1			1	
	1			1	
				1	1
		1	1	1	1
				1	1
				1	1
1					1
	1		1	1	
1	1	1	1		
				1	1
				1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1				
1	1		1		
1	1				
1	1	1			
	1		1	1	1
1	1				
1	1		1	1	
	1	1		1	1
1	1		1		
1		1	1		1
			1	1	1
1		1	1	1	1
1	1		1		
1	1				
1	1		1		
1		1	1		1
			1	1	1
1	1				
1	1		1		
1	1		1		1
1	1		1		1
1	1				
			1	1	1
1	1				
1	1				
1	1	1			
1		1	1	1	1
		1	1	1	1
1	1				
1	1		1		

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
4	4	4	12		
2		4	6		2
4	4	4	12		
1	2	6	9	1	
2			2		1
2	6	5	13	1	
1	1		2		1
1	2		3	1	1
2	1	2	5	1	1
	1	2	3	4	2
2			2		2
	1		1	2	2
1	1	2	4		1
3	3	3	9		
2		2	4		2
	1	2	3	4	2
2	1		3	1	2
2	2	3	7		1
2	1	2	5		1
1		1	2		2
1		1	2		2
2	2	3	7		1
2	2		4	1	2
2	1	3	6	1	
2	2	3	7	1	1
	2	3	5	1	
1			1	1	3
				2	3
2	2	3	7		1
4		1	5		

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
			10		
	2	1	5		
			10		
	1	3	8	3	0
1	2	5	2	5	0
	1	2	8		
	1	8	0	8	0
1	3	7	0	7	0
	2	3	4	1	0
	6	5	0	9	0
1	3	6	1	7	0
	4	4	2	8	0
	1	3	4	1	0
		1	11	2	0
	2	1	3	2	0
	6	5	0	9	0
1	4	3	3	4	0
	1	1	7		
	1	4	3	3	0
	2	2	3	5	0
	2	1	3	6	0
	1	1	7		
2	5	1	3	4	0
	1	5	4	3	0
	2	6	3	3	0
	1	10	0	8	0
	4	6	0	8	0
2	7	6	0	10	0
	1	1	7		
		6	2	4	0

O	X	LR
Tot	Tot	First
10	0	[OX]
6	0	[OO]
10	0	[OO]
11	3	[OO]
7	5	[OX]
10	0	[OO]
8	8	[OX]
7	7	[XO]
7	1	[OO]
5	9	[XO]
7	7	[XX]
6	8	[XX]
7	1	[OX]
12	2	[XO]
4	2	[OO]
5	9	[XX]
6	4	[OO]
8	0	[XO]
7	3	[OO]
5	5	[XX]
4	6	[XX]
8	0	[OO]
4	4	[XX]
9	3	[XO]
9	3	[XO]
10	8	[OO]
6	8	[XX]
6	10	[XX]
8	0	[XO]
8	4	[OX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1b1 [DDR	4/9/92	3:58 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:01 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	4:03 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:05 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:08 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:10 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:13 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	4:15 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:17 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:19 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	4:22 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:24 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:27 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:29 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:31 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:33 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:36 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:38 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	4:41 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	4:44 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:46 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:48 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	4:50 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	4:53 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	4:56 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	4:59 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:01 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:04 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:06 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:09 PM	8	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	11	11	0	0
0	0	11	11	1	0
0	0	11	11	1	0
0	0	11	11	0	0
0	0	11	11	1	1
0	0	11	11	0	1
0	0	11	11	0	2
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	0	2
0	0	11	11	2	0
0	0	11	11	2	0
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	0	2
0	0	11	11	0	2
0	0	11	11	1	1
0	0	11	11	2	0
0	0	11	11	0	2
0	0	11	11	1	1
0	0	11	11	2	0
0	0	11	11	1	0
0	0	11	11	2	0
0	0	11	11	0	1
0	0	11	11	2	0
0	0	11	11	1	1
0	0	11	11	1	0
0	0	11	11	0	2
				26	22
				0.86666667	0.73333333
				0.73029674	0.78491525

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
0			0		
1			0		
1			0		
	0			0	
	1			1	
		0			1
		0			2
1			0		
	1			1	
		0			2
2			0		
2			0		
	1			1	
		1			1
	1			0	
	1			1	
		0			2
		0			2
	1			1	
		2			0
		0			2
	1			1	
2			0		
	1			0	
2			0		
	0			1	
	2			0	
	1			1	
1			0		
		0			2

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0	0			0	0
0	1			0	0
0	1			0	0
0	0			0	0
0	1			1	0
0	0			1	0
0	0			1	1
0	1			0	0
0	1			1	0
0	0			1	1
1	1			0	0
1	1			0	0
0	1			1	0
0	1			1	0
0	1			0	0
0	1			1	0
0	0			1	1
0	0			1	1
1	0			0	1
1	1			0	0
0	0			1	1
0	1			1	0
1	1			0	0
1	0			0	0
1	1			0	0
0	0			0	1
1	1			0	0
1	0			0	1
0	1			0	0
0	0			1	1

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
				1	1
			1		1
			1	1	1
				1	1
			1		1
				1	
			1	1	1
			1		1
		1	1	1	1
		1	1		1
			1	1	1
			1		
			1		
			1		
		1			
		1	1		1
			1		1
		1	1		1
		1			1
		1	1		1
				1	
		1	1	1	1
		1		1	1
			1		1
				1	

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
				1	1
				1	1
				1	1
				1	1
1					1
1		1	1		1
1	1		1		
				1	1
1					1
1	1	1	1		
				1	1
				1	1
1					1
1		1	1		1
		1	1	1	1
1		1			1
1	1	1	1		
1	1	1	1		
	1		1	1	
		1		1	1
1	1	1	1		
1					1
				1	1
		1		1	1
		1		1	1
	1			1	
				1	1
	1			1	
				1	1
1	1		1		

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1	1	1		
1	1	1		1	
1	1	1			
1	1	1	1		
1	1	1		1	
		1	1	1	1
1		1	1		1
1	1	1			
1	1	1		1	
		1	1	1	1
1	1				
1	1			1	
1	1	1			
		1		1	1
		1		1	1
	1	1		1	1
		1	1	1	1
		1	1	1	1
1			1	1	1
	1			1	
		1	1	1	1
1	1	1		1	
1	1			1	
	1		1	1	
	1			1	
1	1	1	1		1
1	1				
1	1		1		
1	1	1		1	
1		1	1		1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1		2	3	1	
1	2		3	1	
1	2	1	4	1	
1	1	2	4	1	1
	2		2	1	
1	1		2	2	1
		2	2	2	3
1	4	2	7	1	
	3		3	2	
				2	3
2	3	1	6		
1	2		3		1
	3	1	4	2	
	1		1	2	
1	1		2	1	
	3		3	2	
				1	1
	1		1	2	2
1		1	2		2
2	2		4	1	
1	1		2	2	3
	3	1	4	2	
2	3		5	1	
3	2		5		2
6	3		9		
1	1	1	3	1	2
3	2	1	6		1
2	1	1	4	1	2
1	3		4	1	1
		1	1	5	5

X	X	O	O	X	X
's			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
	1	5	0	5	0
	1	4	0	4	0
	1	4	0	2	0
	2	5	0	3	0
	1	4	0	6	0
1	4	1	0	5	0
	5	4	0	8	0
	1	3	0	1	0
	2	2	0	4	0
2	7	3	0	9	0
		7	0	3	0
	1	5	0	3	0
	2	4	0	4	0
1	3	2	0	6	0
2	3	2	0	4	0
1	3	2	0	4	0
2	4	3	0	7	0
2	6	3	0	9	0
1	3	8	0	6	0
1	2	6	0	2	0
1	6	1	0	7	0
1	3	4	0	4	0
	1	5	0	1	0
1	3	9	0	7	0
4	4	9	0	7	0
	3	4	0	4	0
	1	9	0	3	0
	3	6	0	2	0
	2	5	0	3	0
	10	3	0	9	0

O	X	LR
Tot	Tot	First
5	5	[OO]
4	4	[OO]
4	2	[OO]
5	3	[XO]
4	6	[XO]
1	5	[XX]
4	8	[XX]
3	1	[OO]
2	4	[XO]
3	9	[XX]
7	3	[OO]
5	3	[OO]
4	4	[XO]
2	6	[XX]
2	4	[OX]
2	4	[XO]
3	7	[XX]
3	9	[XX]
8	6	[OX]
6	2	[XX]
1	7	[XX]
4	4	[XO]
5	1	[OO]
9	7	[OX]
9	7	[OO]
4	4	[OX]
9	3	[XO]
6	2	[OX]
5	3	[OO]
3	9	[XX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1b1 [DDR	4/9/92	5:12 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	5:14 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:17 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:19 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	5:21 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:24 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:27 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:29 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:32 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:35 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	5:37 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:39 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:42 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	5:45 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:48 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:50 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:52 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	5:55 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	5:58 PM	9	VL	vc
gmb1b1 [DDR	4/9/92	6:00 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	6:03 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	6:05 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	6:08 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	6:10 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	6:13 PM	7	VL	vc
gmb1b1 [DDR	4/9/92	6:15 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	6:17 PM	6	VL	vc
gmb1b1 [DDR	4/9/92	6:20 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	6:23 PM	8	VL	vc
gmb1b1 [DDR	4/9/92	6:25 PM	8	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *
* *	* *	VL	vc	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	0
0	0	111	111	0	0
0	0	111	111	1	0
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	0	2
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	1	0
0	0	111	111	1	0
0	0	111	111	0	1
0	0	111	111	0	0
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	2	0
				38	8
				1.26666667	0.26666667
				0.69149181	0.52083046

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	1			1	
	1			1	
	1			0	
		0			0
1			0		
		1			1
1			1		
	2			0	
	2			0	
1			0		
2			0		
		1			0
1			0		
	2			0	
		1			0
		2			0
	1			1	
	2			0	
		0			2
		2			0
2			0		
2			0		
	1			0	
	1			0	
		1			0
0			1		
	0			0	
	2			0	
	2			0	
	2			0	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0	1			1	0
0	1			1	0
1	0			0	0
0	0			0	0
0	1			0	0
1	0			0	1
0	1			1	0
1	1			0	0
1	1			0	0
0	1			0	0
1	1			0	0
1	0			0	0
1	0			0	0
1	1			0	0
0	1			0	0
1	1			0	0
1	0			0	1
1	1			0	0
0	0			1	1
1	1			0	0
1	1			0	0
1	1			0	0
0	1			0	0
0	1			0	0
0	1			0	0
0	0			1	0
0	0			0	0
1	1			0	0
1	1			0	0
1	1			0	0

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
			1		
			1	1	1
		1			1
				1	1
			1	1	1
		1			
			1		
		1	1	1	1
		1	1	1	1
			1		1
		1	1	1	1
		1		1	1
		1		1	1
		1	1	1	1
			1	1	1
		1	1	1	1
		1		1	
		1	1	1	1
		1	1	1	1
		1	1	1	1
		1	1	1	1
			1	1	1
			1		
			1	1	1
				1	
				1	1
		1	1		1
		1	1	1	1
		1	1	1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
1		1	1		1
1					1
				1	1
				1	1
				1	1
	1	1	1	1	
1		1	1		1
				1	1
				1	1
		1		1	1
				1	1
				1	1
				1	1
				1	1
				1	1
				1	1
	1			1	
				1	1
1	1	1	1		
				1	1
				1	1
				1	1
				1	1
		1	1	1	1
				1	1
1			1		1
				1	1
		1		1	1
				1	1
				1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
		1		1	1
1	1	1			
1	1		1	1	
1	1	1	1		
1	1	1			
			1	1	1
		1		1	1
1	1				
1	1				
	1	1		1	
1	1				
1	1		1		
1	1		1		
1	1				
1	1	1			
1	1				
1	1		1		1
1	1				
		1	1	1	1
1	1				
1	1				
1	1				
1	1	1			
		1		1	1
1	1	1			
1		1	1		1
1	1	1	1		
	1			1	
1	1				
1	1				

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
	2		2	2	1
	3	1	4	2	
2	1		3		1
1	2	1	4	1	2
1	3	3	7	1	1
2	1		3	1	3
	1		1	1	
6	4	2	12		
2	3	3	8	1	
1	3		4	1	
2	3	3	8	1	
2	1	2	5		1
1	1	1	3		1
6	2	1	9		
1	3	3	7	1	
2	3	3	8	1	
2	1	1	4	1	3
2	4	2	8	1	1
				6	5
2	3	3	8	1	
2	3	3	8	1	
3	5	6	14		
1	3	1	5	1	
1	1		2	1	
1	3	2	6	1	1
	2	1	3	2	2
1	2	1	4	1	2
6	2		8		
2	2	1	5	1	1
2	6	5	13	1	

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	4	6	1	7	0
	2	3	0	5	0
	1	5	4	5	0
	3		4	2	0
	2	2	5	1	0
2	6	1	3	4	0
2	3	6	0	8	0
		4	7	1	0
	1		9	1	0
1	2	7	1	6	0
	1	2	6		
	1	3	3	2	0
	1	4	3	5	0
		3	7	2	0
	1		9	3	0
	1		9	1	0
	4	2	3	3	0
	2	5	3	2	0
1	12	4	0	12	0
	1		9	1	0
	1	2	6		
		2	10		
	1	2	3	1	0
2	3	3	2	7	0
1	3		6	2	0
	4	1	4	5	0
	3		4	2	0
1	1	1	7	4	0
	2	4	4	4	0
	1	2	8		

O	X	LR
Tot	Tot	First
7	7	[OX]
3	5	[OX]
9	5	[OX]
4	2	[XX]
7	1	[OO]
4	4	[XX]
6	8	[OO]
11	1	[OX]
9	1	[XO]
8	6	[OO]
8	0	[OO]
6	2	[XX]
7	5	[OO]
10	2	[OX]
9	3	[XX]
9	1	[XX]
5	3	[OX]
8	2	[XO]
4	12	[XX]
9	1	[XX]
8	0	[OO]
12	0	[OO]
5	1	[OX]
5	7	[OX]
6	2	[XX]
5	5	[OO]
4	2	[XO]
8	4	[OX]
8	4	[XO]
10	0	[XO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1b1 [DDR	4/9/92	6:27 PM	5	VL	vr
gma1b1 [DDR	4/9/92	6:30 PM	8	VL	vr
gma1b1 [DDR	4/9/92	6:32 PM	7	VL	vr
gma1b1 [DDR	4/9/92	6:34 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:36 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:39 PM	7	VL	vr
gma1b1 [DDR	4/9/92	6:41 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:44 PM	8	VL	vr
gma1b1 [DDR	4/9/92	6:46 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:48 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:50 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:52 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:54 PM	6	VL	vr
gma1b1 [DDR	4/9/92	6:56 PM	5	VL	vr
gma1b1 [DDR	4/9/92	6:58 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:00 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:02 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:04 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:06 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:09 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:10 PM	5	VL	vr
gma1b1 [DDR	4/9/92	7:13 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:15 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:17 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:19 PM	5	VL	vr
gma1b1 [DDR	4/9/92	7:22 PM	8	VL	vr
gma1b1 [DDR	4/9/92	7:24 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:26 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:28 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:30 PM	5	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	0	0	0	1
0	0	0	0	2	1
0	0	0	0	1	0
0	0	0	0	0	1
0	0	0	0	0	1
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	2
0	0	0	0	1	2
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	2
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	0	2
0	0	0	0	1	2
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	2
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	0	1
				32	35
				1.06666667	1.16666667
				0.63968383	0.46113304

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
		0			1
2			1		
	1			0	
		0			1
	0			1	
		1			1
2			1		
1			2		
	1			2	
2			1		
	1			1	
	1			1	
2			1		
	1			1	
2			1		
		1			1
	1			1	
	1			2	
	1			1	
2			1		
	1			1	
		0			2
		1			2
	1			1	
	1			1	
		1			2
1			1		
2			1		
	1			1	
		0			1

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Mis
ML	MC	MR	MO	ML	MC
0		0		0	1
1		1		0	1
1		0		0	0
0		0		0	1
0		0		0	1
0		1		0	1
1		1		0	1
0		1		1	1
0		1		1	1
1		1		0	1
0		1		0	1
0		1		0	1
1		1		0	1
0		1		0	1
1		1		0	1
1		0		0	1
[illegible]		0		0	1
0		1		1	1
0		1		0	1
1		1		0	1
1		0		0	1
0		0		1	1
0		1		1	1
0		1		0	1
0		1		0	1
0		1		1	1
0		1		0	1
1		1		0	1
0		1		0	1
0		0		0	1

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
		1		1	1
		1			1
				1	
		1		1	1
				1	
				1	
		1		1	1
				1	
				1	
		1		1	
				1	
		1		1	
		1			
		1			
				1	
				1	
		1		1	
		1			
				1	
				1	
				1	
				1	
				1	
		1		1	1
				1	

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
	1		1	1	
	1			1	
		1		1	1
	1	1	1	1	
	1		1	1	
	1		1	1	
	1			1	
1	1		1		
1	1		1		
	1			1	
	1		1	1	
	1		1	1	
	1			1	
	1		1	1	
	1		1	1	
	1	1	1	1	
	1	1	1	1	
1	1		1		
	1			1	
	1			1	
	1	1	1	1	
1	1		1		
1	1		1		
	1		1	1	
	1		1	1	
1	1		1		
	1		1	1	
	1			1	
	1		1	1	
	1		1	1	

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1		1	1	1	1
1	1		1		
	1		1	1	
		1	1	1	1
1		1	1	1	1
1		1	1		1
1	1		1		
1		1	1		1
1		1	1		1
1	1		1		
1		1	1		1
1		1	1		1
1	1		1		1
1		1	1		1
1			1		1
			1	1	1
			1	1	1
1		1	1		1
1	1	1	1		1
1	1		1		1
			1	1	1
1		1	1	1	1
1		1	1		1
1		1	1		1
1		1	1		1
1		1	1		1
1		1	1		1
1	1		1		
1		1	1		1
1		1	1	1	1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1		1	2	1	8
1		2	3		1
2	1		3		1
1			1	1	5
1		1	2	1	5
1		1	2	1	3
2		2	4		2
		1	1	1	1
		2	2	1	2
2		2	4		2
1		1	2	1	5
1		1	2	1	5
2		2	4		4
1		2	3	1	5
2		1	3		4
1			1		4
2			2		5
		1	1	1	3
1		2	3	1	2
2		2	4		4
2			2		4
		1	1	1	6
		2	2	1	4
1		2	3	1	3
1		2	3	1	5
		1	1	2	2
1		2	3	1	4
1	1	3	5		2
1		2	3	1	4
1		1	2	1	8

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	10			2	0
	1	6	0	4	0
1	2	5	0	5	0
1	7			4	0
1	7	2	0	2	0
	4	4	0	4	0
	2	4	0	2	0
	2	5	0	7	0
	3	3	0	3	0
	2	3	0	1	0
	6	2	0	4	0
	6	1	0	3	0
	4	3	0	1	0
	6	1	0	1	0
	4	2	0	2	0
1	5	3	0	5	0
1	6	1	0	3	0
	4	2	0	2	0
	3	4	0	4	0
	4	3	0	1	0
1	5	1	0	1	0
1	8	2	0	4	0
	5	4	0	4	0
	4	4	0	2	0
	5	1	0	1	0
	4	4	0	2	0
	5	3	0	1	0
	2	5	0	1	0
	5	4	0	2	0
1	10			2	0

O	X	LR
Tot	Tot	First
0	2	[XX]
6	4	[OO]
5	5	[OX]
0	4	[XX]
2	2	[OX]
4	4	[XX]
4	2	[OO]
5	7	[OO]
3	3	[XO]
3	1	[OO]
2	4	[XO]
1	3	[XO]
3	1	[OO]
1	1	[XO]
2	2	[OO]
3	5	[XX]
1	3	[OX]
2	2	[XO]
4	4	[XO]
3	1	[OO]
1	1	[OX]
2	4	[XX]
4	4	[XX]
4	2	[XO]
1	1	[XO]
4	8	[XX]
3	1	[OO]
5	1	[OO]
4	2	[XO]
0	2	[XX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1b1 [DDR	4/9/92	7:32 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:34 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:36 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:38 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:41 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:43 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:45 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:47 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:49 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:52 PM	8	VL	vr
gma1b1 [DDR	4/9/92	7:54 PM	7	VL	vr
gma1b1 [DDR	4/9/92	7:56 PM	6	VL	vr
gma1b1 [DDR	4/9/92	7:58 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:00 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:02 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:04 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:06 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:09 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:11 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:13 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:15 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:17 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:19 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:21 PM	8	VL	vr
gma1b1 [DDR	4/9/92	8:23 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:26 PM	8	VL	vr
gma1b1 [DDR	4/9/92	8:28 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:30 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:32 PM	7	VL	vr
gma1b1 [DDR	4/9/92	8:34 PM	6	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	0	2
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	1	2
0	0	100	100	2	1
0	0	100	100	1	2
0	0	100	100	0	2
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	1	1
				40	34
				1.33333333	1.13333333
				0.60647843	0.3457459

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
		1			1
2			1		
2			1		
		0			2
	1			1	
		2			1
		2			1
		1			1
	1			1	
1			1		
	2			1	
	2			1	
	2			1	
		2			1
	1			1	
	1			1	
2			1		
	1			1	
	1			1	
		1			1
	1			1	
2			1		
	1			1	
	1			2	
	2			1	
1			2		
		0			2
2			1		
	1			1	
	1			1	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0		1		0	1
1		1		0	1
1		1		0	1
0		0		1	1
1		0		0	1
1		1		0	1
1		1		0	1
0		1		0	1
0		1		0	1
0		1		0	1
1		1		0	1
1		1		0	1
1		1		0	1
1		1		0	1
0		1		0	1
0		1		0	1
1		1		0	1
1		0		0	1
0		1		0	1
0		1		0	1
0		1		0	1
1		1		0	1
0		1		0	1
0		1		1	1
1		1		0	1
0		1		1	1
0		0		1	1
1		1		0	1
0		1		0	1
0		1		0	1

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
				1	
		1		1	1
		1		1	1
		1			
		1		1	1
		1		1	1
				1	
				1	1
				1	1
		1		1	1
		1		1	
		1		1	1
		1		1	1
				1	
				1	
		1		1	
		1			
				1	
				1	
				1	
		1		1	1
				1	
				1	
		1		1	
				1	1
		1		1	1
				1	1
				1	

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
	1		1	1	
	1			1	
	1			1	
1	1	1	1		
	1		1	1	
	1			1	
	1			1	
	1		1	1	
	1			1	
	1			1	
	1			1	
	1			1	
	1			1	
	1		1	1	
	1		1	1	
	1			1	
	1	1	1	1	
	1		1	1	
	1		1	1	
	1		1	1	
	1			1	
	1		1	1	
1	1		1		
	1			1	
1	1				
1	1		1		
	1			1	
	1			1	
	1		1	1	

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1		1	1		1
1	1		1		
1	1		1		
		1	1	1	1
1			1	1	1
1	1		1		
1	1		1		
1		1	1		1
1	1	1	1		
1	1	1	1		
1	1		1		
1	1		1		1
1	1		1		
1	1		1		
1		1	1		1
1		1	1		1
1	1		1		1
			1	1	1
1		1	1		1
1		1	1		1
1		1	1		1
1	1		1		
1		1	1		1
1		1	1		1
1	1		1		1
1	1	1	1		
1		1	1	1	1
1	1		1		
1	1	1	1		
1		1	1		1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1		2	3	1	4
2		4	6		1
3		2	5		3
				1	4
2		1	3		4
2		3	5		3
2		3	5		3
1		2	3	1	5
1		3	4	1	1
		3	3		1
2		2	4		2
2		2	4		4
2		3	5		2
2		3	5		3
1		2	3	1	4
1		2	3	1	3
2		2	4		4
3			3		3
1		2	3	1	4
1		2	3	1	5
1		2	3	1	4
3		2	5		3
1		2	3	1	4
		2	2	1	2
2		2	4		4
		3	3	1	1
		1	1	1	3
2		3	5		3
1		3	4	1	2
1		2	3	1	4

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
	5	1	3	2	0
	1	3	3		
	3	2	2		
1	6	1	0	3	0
1	5	2	2	2	0
	3		5	1	0
	3		5	1	0
	6		2	2	0
	2	4	3	3	0
	1	5	1	4	0
	2	1	3	2	0
	4	2	1	1	0
	2	1	3		
	3		5	1	0
	5	2	1	1	0
	4	3	0	1	0
	4	2	1	1	0
1	4	1	2	1	0
	5	2	1	3	0
	6		2	2	0
	5	1	1	2	0
	3	2	2		
	5	2	1	1	0
	3	4	2	6	0
	4	2	1	1	0
	2	4	1	5	0
1	5	2	0	2	0
	3	1	3		
	3	1	5	2	0
	5	1	2	1	0

O	X	LR
Tot	Tot	First
4	2	[XX]
6	0	[OO]
4	0	[OO]
1	3	[XX]
4	2	[OX]
5	1	[XX]
5	1	[XX]
2	2	[XX]
7	3	[XO]
6	4	[OO]
4	2	[OX]
3	1	[OX]
4	0	[OX]
5	1	[XX]
3	1	[OX]
3	1	[XO]
3	1	[OO]
3	1	[OX]
3	3	[OX]
2	2	[XX]
2	2	[OX]
4	0	[OO]
3	1	[OX]
6	6	[XO]
3	1	[OX]
5	5	[OO]
2	2	[XX]
4	0	[OO]
6	2	[OX]
3	1	[XO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1b1 [DDR	4/9/92	8:37 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:39 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:41 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:43 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:45 PM	7	VL	vr
gma1b1 [DDR	4/9/92	8:47 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:49 PM	5	VL	vr
gma1b1 [DDR	4/9/92	8:51 PM	7	VL	vr
gma1b1 [DDR	4/9/92	8:53 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:55 PM	5	VL	vr
gma1b1 [DDR	4/9/92	8:57 PM	6	VL	vr
gma1b1 [DDR	4/9/92	8:59 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:01 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:03 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:05 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:08 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:10 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:12 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:14 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:16 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:18 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:20 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:22 PM	5	VL	vr
gma1b1 [DDR	4/9/92	9:24 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:26 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:28 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:31 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:33 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:35 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:37 PM	6	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	11	11	1	1
0	0	11	11	1	2
0	0	11	11	0	2
0	0	11	11	2	1
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	2	1
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	2	1
0	0	11	11	1	2
0	0	11	11	1	2
0	0	11	11	2	1
0	0	11	11	1	0
0	0	11	11	1	2
0	0	11	11	1	2
0	0	11	11	2	1
0	0	11	11	0	1
0	0	11	11	2	1
0	0	11	11	2	1
0	0	11	11	1	1
0	0	11	11	2	1
0	0	11	11	2	1
0	0	11	11	0	1
0	0	11	11	1	1
0	0	11	11	0	1
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	2	1
				36	35
				1.2	1.16666667
				0.66436384	0.46113304

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	1			1	
	1			2	
		0			2
2			1		
		1			1
	1			1	
2			1		
	1			1	
	1			1	
	2			1	
	1			2	
	1			2	
		2			1
	1			0	
	1			2	
	1			2	
2			1		
		0			1
2			1		
2			1		
	1			1	
2			1		
	2			1	
		0			1
	1			1	
		0			1
	1			1	
	1			1	
	1			1	
2			1		

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Mis
ML	MC	MR	MO	ML	MC
1		0		0	1
0		1		1	1
0		0		1	1
1		1		0	1
1		0		0	1
1		0		0	1
1		1		0	1
1		0		0	1
1		0		0	1
1		1		0	1
0		1		1	1
0		1		1	1
1		1		0	1
0		1		0	0
0		1		1	1
0		1		1	1
1		1		0	1
0		0		0	1
1		1		0	1
1		1		0	1
1		0		0	1
1		1		0	1
1		1		0	1
0		0		0	1
1		0		0	1
0		0		0	1
1		0		0	1
1		0		0	1
1		0		0	1
1		1		0	1

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
		1			
				1	
		1		1	1
		1			
		1			
		1		1	1
		1			
		1			
		1		1	1
				1	
				1	
		1		1	1
				1	1
				1	
				1	
		1		1	1
		1		1	1
		1		1	1
		1			
		1		1	1
		1		1	1
		1			
		1			
		1			
		1			
		1		1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
	1	1	1	1	
1	1		1		
1	1		1		
	1			1	
	1	1	1	1	
	1		1	1	
	1			1	
	1			1	
	1	1	1	1	
	1			1	
1	1		1		
1	1		1		
	1			1	
				1	1
1	1		1		
1	1		1		
	1			1	
	1		1	1	
	1			1	
	1			1	
	1		1	1	
	1			1	
	1			1	
	1		1	1	
	1		1	1	
	1	1	1	1	
	1	1	1	1	
	1			1	
	1	1	1	1	
	1			1	

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
			1	1	1
1		1	1		1
1		1	1	1	1
1	1		1		
			1	1	1
1			1	1	1
1	1		1		
1	1		1	1	1
			1	1	1
1	1		1		
1		1	1		1
1		1	1		1
1	1		1		
1	1	1	1		
1		1	1		1
1		1	1		1
1	1		1		
1		1	1	1	1
1	1		1		
1	1		1		
1			1	1	1
1	1		1		
1	1		1		
1		1	1	1	1
1			1	1	1
		1	1	1	1
			1	1	1
1	1		1	1	1
			1	1	1
1	1		1		

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
2			2		5
		2	2	1	2
				1	3
1		2	3		2
1			1		2
2			2		3
2		2	4		2
2		1	3		2
2			2		5
1		2	3		2
		2	2	1	5
		2	2	1	5
1		1	2		1
1	1	1	3	1	1
		2	2	1	5
		2	2	1	4
1		2	3		1
1		1	2	1	3
2		2	4		3
2		1	3		2
2		1	3		4
2		2	4		3
1		2	3		2
1		1	2	1	8
2			2		3
1			1	1	5
1			1		5
2		1	3		2
3			3		3
2		2	4		3

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	6	1	0	3	0
	3	2	0	4	0
	4	1	0	3	0
	2	2	0	2	0
2	4			6	0
	3	2	0	2	0
	2	2	0		
1	3	3	0	3	0
1	6	1	0	3	0
	2	1	0	1	0
	6	1	0	3	0
	6	1	0	3	0
	1	5	0	3	0
	2	4	0	4	0
	6	1	0	3	0
	5	2	0	2	0
	1	5	0	3	0
1	5	3	0	3	0
	3	4	0		
	2	3	0	3	0
1	5	3	0	1	0
	3	4	0		
	2	1	0	1	0
1	10	1	0	3	0
	3	2	0	2	0
1	7	1	0	5	0
2	7	1	0	7	0
1	3	3	0	3	0
1	4	4	0	2	0
	3	4	0		

O	X	LR
Tot	Tot	First
1	3	[OX]
2	4	[XO]
1	3	[XX]
2	2	[OO]
0	6	[XX]
2	2	[OX]
2	0	[OO]
3	3	[OX]
1	3	[OX]
1	1	[XO]
1	3	[XO]
1	3	[XO]
5	3	[XX]
4	4	[XO]
1	3	[XO]
2	2	[XO]
5	3	[OO]
3	3	[XX]
4	0	[OO]
3	3	[OO]
3	1	[OX]
4	0	[OO]
1	1	[XO]
1	3	[XX]
2	2	[OX]
1	5	[XX]
1	7	[OX]
3	3	[OX]
4	2	[OX]
4	0	[OO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gma1b1 [DDR	4/9/92	9:39 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:41 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:44 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:46 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:48 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:50 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:52 PM	6	VL	vr
gma1b1 [DDR	4/9/92	9:55 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:57 PM	7	VL	vr
gma1b1 [DDR	4/9/92	9:59 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:02 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:04 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:06 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:08 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:10 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:13 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:15 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:17 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:19 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:21 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:24 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:26 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:28 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:30 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:32 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:35 PM	7	VL	vr
gma1b1 [DDR	4/9/92	10:37 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:39 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:41 PM	6	VL	vr
gma1b1 [DDR	4/9/92	10:43 PM	6	VL	vr

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**
**	**	VL	vc	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	0
0	0	111	111	2	0
0	0	111	111	2	1
0	0	111	111	1	1
0	0	111	111	2	1
0	0	111	111	1	2
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	1	2
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	0	2
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	0
0	0	111	111	2	1
0	0	111	111	1	2
0	0	111	111	2	1
0	0	111	111	2	1
				52	28
				1.73333333	0.93333333
				0.52083046	0.58329228

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	2			1	
	2			1	
2			0		
2			0		
2			1		
		1			1
2			1		
		1			2
		2			1
	2			1	
2			0		
		1			1
	1			2	
	2			1	
		2			1
2			1		
	2			1	
		0			2
	2			1	
2			1		
		1			0
2			0		
	2			1	
2			1		
	2			1	
2			0		
		2			1
	1			2	
2			1		
	2			1	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
1		1		0	1
1		1		0	1
1		1		0	0
1		1		0	0
1		1		0	1
1		0		0	1
1		1		0	1
0		1		1	1
1		1		0	1
1		1		0	1
1		1		0	0
0		1		0	1
0		1		1	1
1		1		0	1
1		1		0	1
1		1		0	1
1		1		0	1
0		0		1	1
1		1		0	1
1		1		0	1
0		1		0	0
1		1		0	0
1		1		0	1
1		1		0	1
1		1		0	1
1		1		0	0
1		1		0	1
0		1		1	1
1		1		0	1
1		1		0	1

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1			
		1		1	1
				1	1
		1		1	1
		1		1	1
		1		1	1
				1	1
				1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
				1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
				1	
		1		1	1
		1		1	1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
	1			1	
	1			1	
				1	1
				1	1
	1			1	
	1	1	1	1	
	1			1	
1	1				
	1			1	
	1			1	
				1	1
	1			1	
1	1				
	1			1	
	1			1	
	1			1	
	1			1	
1	1	1	1		
	1			1	
	1			1	
				1	1
				1	1
	1			1	
	1			1	
	1			1	
				1	1
	1			1	
1	1		1		
	1			1	
	1			1	

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1		1		
1	1		1		
1	1		1		
1	1		1		
1	1		1		
			1	1	1
1	1		1		.
1	1	1	1		
1	1		1		
1	1		1		
1	1		1		
1	1	1	1		
1	1	1	1		
1	1		1		
1	1		1		
1	1		1		
1	1		1		
		1	1	1	1
1	1		1		
1	1		1		
1	1	1	1		
1	1		1		
1	1		1		
1	1		1		
1	1		1		
1	1		1		
1	1		1		
1		1	1		1
1	1		1		
1	1		1		

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
3		3	6		2
2		3	5		3
3	1	4	8		1
3	2	3	8		2
3		1	4		3
2			2		4
3		3	6		2
		4	4	1	1
2		4	6		1
3		2	5		2
3	1	4	8		1
1	1	3	5	1	2
		3	3	1	1
3		2	5		2
3		3	6		1
2	1	3	6		2
3		2	5		2
				1	1
3		4	7		1
3		3	6		2
1	1	4	6	1	1
3	1	4	8		1
3		3	6		2
3		3	6		2
3		3	6		2
3	1	4	8		1
2		3	5		3
		3	3	1	3
3		3	6		2
2		3	5		2

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
	2	1	5		
	3		5	1	0
	1	1	7		
	2	1	5		
	3	2	2	2	0
1	5		2	4	0
	2		6		
	2		5	1	0
	1		7	1	0
	2	1	4	1	0
	1	2	6		
	3	1	3	2	0
	2	1	2	1	0
	2		5	1	0
	1		7	1	0
	2	2	3	1	0
	2		5	1	0
1	6			4	0
	1		8		
	2	1	5		
	2		7	1	0
	1	2	6		
	2		6		
	2	1	5		
	2		6		
	1	2	6		
	3		5	1	0
	4		3	3	0
	2	1	5		
	2	1	4	1	0

O	X	LR
Tot	Tot	First
6	0	[OX]
5	1	[XO]
8	0	[OO]
6	0	[OO]
4	2	[OO]
2	4	[XX]
6	0	[OO]
5	1	[XX]
7	1	[XX]
5	1	[OX]
8	0	[OO]
4	2	[XX]
3	1	[XO]
5	1	[OX]
7	1	[XX]
5	1	[OO]
5	1	[OX]
0	4	[XX]
8	0	[OX]
6	0	[OO]
7	1	[XX]
8	0	[OO]
6	0	[XO]
6	0	[OO]
6	0	[OX]
8	0	[OO]
5	1	[XX]
3	3	[XO]
6	0	[OO]
5	1	[XO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1a2 [DDR	4/16/92	11:23 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:26 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:28 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:30 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:32 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:35 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:37 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:39 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:41 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:43 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:45 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:47 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:49 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:52 AM	7	VL	vc
gmb1a2 [DDR	4/16/92	11:54 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:56 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	11:58 AM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:00 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:02 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:04 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:06 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:09 PM	7	VL	vc
gmb1a2 [DDR	4/16/92	12:11 PM	7	VL	vc
gmb1a2 [DDR	4/16/92	12:13 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:15 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:17 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:20 PM	7	VL	vc
gmb1a2 [DDR	4/16/92	12:22 PM	6	VL	vc
gmb1a2 [DDR	4/16/92	12:24 PM	7	VL	vc
gmb1a2 [DDR	4/16/92	12:26 PM	7	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	2	0
0	0	0	0	2	0
0	0	0	0	2	1
0	0	0	0	1	2
0	0	0	0	1	1
0	0	0	0	1	2
0	0	0	0	1	2
0	0	0	0	2	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	1	2
0	0	0	0	2	1
0	0	0	0	1	0
0	0	0	0	1	2
0	0	0	0	1	1
0	0	0	2	1	2
0	0	0	2	1	2
0	0	0	0	1	1
0	0	0	0	1	0
0	0	0	0	1	1
0	0	0	0	2	1
0	0	0	0	2	1
0	0	0	0	1	1
0	0	0	0	2	1
				41	33
				1.36666667	1.1
				0.49013252	0.60742532

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
	2			1	
	1			1	
	1			1	
	1			1	
2			1		
		1			1
2			0		
2			0		
2			1		
	1			2	
		1			1
		1			2
		1			2
	2			1	
	2			1	
	1			1	
		1			2
	2			1	
1			0		
		1			2
	1			1	
	1			2	
		1			2
	1			1	
1			0		
	1			1	
		2			1
	2			1	
	1			1	
2			1		

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
1	1			0	
0	1			1	
0	1			1	
0	1			0	
1	1			0	
0	1			0	
1	1			0	
1	1			0	
1	1			0	
0	1			1	
0	1			0	
0	1			1	
0	1			1	
1	1			0	
1	1			0	
0	1			1	
0	1			1	
1	1			0	
0	1			0	
0	1			1	
0	1			1	
0	1			1	
0	1			1	
0	1			0	
0	1			0	
0	1			1	
1	1			0	
1	1			0	
0	1			0	
1	1			0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
1		1	1		1
0			1		1
0			1		1
1			1		1
1		1	1		1
1			1		
0		1	1	1	1
0		1	1		1
1		1	1		1
1			1		
1			1		
1			1		
1			1		
1		1	1		1
1		1	1		1
0			1		
1			1		
1		1	1		1
0			1		1
1			1		
0			1		1
1			1		
1			1		
1			1		
0			1	1	1
0			1	1	1
1		1	1		1
1		1	1		1
1			1		1
1		1	1		1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
		1		1	1
1					1
1					1
		1		1	1
		1		1	1
		1		1	1
				1	1
				1	1
		1		1	1
1		1			1
		1		1	1
1		1	1		1
1		1	1		1
		1		1	1
		1		1	1
1					1
1		1	1		1
		1		1	1
				1	1
1		1			1
1					1
1		1	1		1
1		1	1		1
		1		1	1
				1	1
1					1
		1		1	1
		1		1	1
		1		1	1
		1		1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
	1			1	
1	1	1		1	
1	1	1		1	
	1	1		1	
	1			1	
	1	1		1	1
1	1				
1	1			1	
	1			1	
	1	1		1	1
	1	1		1	1
		1		1	1
		1		1	1
	1			1	
	1			1	
1	1	1		1	1
		1		1	1
	1			1	
1	1	1		1	
	1	1		1	1
1	1	1		1	
		1		1	1
		1		1	1
	1	1		1	1
1	1	1			
1	1	1			
	1			1	
	1			1	
	1	1		1	
	1			1	

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
2	4		6	1	
	4	1	5	3	
	4		4	2	
1	4		5	1	
1	4		5		
1	2		3	1	
1	5	1	7		
1	5	1	7		
1	2		3		
	4		4	2	
1	2		3	1	
	2		2	2	
	3		3	2	
1	3		4		
1	2		3		
	2		2	1	1
	3		3	2	
1	5		6		
1	6		7	1	
	3		3	2	
	5	1	6	2	
	2		2	2	1
	1		1	2	
1	2		3	1	
1	5	1	7	1	
	4	1	5	2	
1	2		3		
1	4		5		
1	3		4	1	
2	4		6	1	

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
2	3	4	0	2	0
1	4	2	0	4	0
	2	2	0	2	0
1	2	4	0	4	0
1	1	4	0	4	0
2	3	3	0	3	0
		6	0		
1	1	5	0	1	0
1	1	5	0	1	0
2	4	2	0	4	0
2	3	2	0	4	0
2	4	1	0	3	0
3	5			4	0
2	2	5	0	3	0
1	1	4	0	2	0
	2	3	0	3	0
3	5			4	0
2	2	4	0	2	0
	1	4	0	2	0
1	3	1	0	3	0
1	3	1	0	3	0
1	4	3	0	5	0
2	4	2	0	6	0
2	3	2	0	4	0
	1	5	0	1	0
	2	2	0	2	0
2	2	4	0	2	0
2	2	2	0	2	0
2	3	4	0	4	0
1	2	5	0	1	0

O	X	LR
Tot	Tot	First
4	2	[OX]
2	4	[XO]
2	2	[XO]
4	4	[OX]
4	4	[OO]
3	3	[XX]
6	0	[OO]
5	1	[OO]
5	1	[OO]
2	4	[OX]
2	4	[XX]
1	3	[XX]
0	4	[XX]
5	3	[OX]
4	2	[OX]
3	3	[XO]
0	4	[XX]
4	2	[OX]
4	2	[OO]
1	3	[XX]
1	3	[XO]
3	5	[XO]
2	6	[XX]
2	4	[OX]
5	1	[OO]
2	2	[XO]
4	2	[XX]
2	2	[OX]
4	4	[OX]
5	1	[OO]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1a2 [DDR	4/9/92	10:46 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	10:48 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	10:50 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	10:52 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	10:55 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	10:57 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	10:59 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	11:01 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:04 PM	8	VL	vc
gmb1a2 [DDR	4/9/92	11:06 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:08 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:10 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:13 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	11:15 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	11:17 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:19 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:21 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:23 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:26 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:28 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:30 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:32 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:34 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:36 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:39 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:41 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	11:44 PM	8	VL	vc
gmb1a2 [DDR	4/9/92	11:46 PM	8	VL	vc
gmb1a2 [DDR	4/9/92	11:48 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:51 PM	7	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**
**	**	VL	vr	**	**

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	100	100	2	0
0	0	100	100	2	1
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	1
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	1	0
0	0	100	100	2	0
0	0	100	100	2	1
0	0	100	100	1	0
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	1	1
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	1	0
0	0	100	100	2	1
0	0	100	100	2	1
0	0	100	100	1	0
0	0	100	100	1	1
0	0	100	100	2	0
0	0	100	100	1	0
				44	16
				1.46666667	0.53333333
				0.50741626	0.50741626

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
2			0		
		2			1
	1			0	
	2			0	
		1			1
	1			1	
2			0		
	2			1	
	1			1	
	2			0	
		1			1
	1			0	
1			1		
	1			0	
	2			0	
	2			1	
	1			0	
		1			0
		1			1
	2			1	
	1			1	
	2			1	
	2			1	
		1			0
	2			1	
	2			1	
	1			0	
	1			1	
		2			0
		1			0

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
1	1			0	
1	1			0	
0	1			0	
1	1			0	
0	1			0	
0	1			0	
1	1			0	
1	1			0	
0	1			1	
1	1			0	
0	1			0	
0	1			0	
0	1			0	
0	1			0	
1	1			0	
1	1			0	
0	1			0	
0	1			0	
0	1			0	
1	1			0	
0	1			0	
1	1			0	
1	1			0	
0	1			0	
1	1			0	
1	1			0	
0	1			0	
0	1			1	
1	1			0	
0	1			0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
0		1	1	1	1
1		1	1		1
0			1	1	1
0		1	1		1
1			1		1
1			1		1
0		1	1	1	1
1		1	1		1
0			1	1	1
0		1	1	1	1
1			1		1
0			1	1	1
1			1		1
0			1		1
0		1	1	1	1
1		1	1		1
0			1		1
0			1	1	1
1			1		1
1		1	1		1
1			1		1
1		1	1		1
1		1	1		1
0			1	1	1
1		1	1		1
1		1	1		1
0			1	1	1
0			1	1	1
0		1	1	1	1
0			1		1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
				1	1
		1		1	1
				1	1
				1	1
		1		1	1
		1		1	1
				1	1
		1		1	1
1					1
				1	1
		1		1	1
				1	1
		1		1	1
				1	1
				1	1
		1		1	1
				1	1
				1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
				1	1
		1		1	1
		1		1	1
				1	1
1					1
				1	1
				1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
1	1				
	1			1	
1	1	1			
1	1			1	
	1	1		1	
	1	1		1	
1	1				
	1			1	
1	1	1			
1	1				
	1	1		1	
1	1	1			
	1	1		1	
1	1	1		1	
1	1				
	1			1	
1	1	1		1	
1	1	1			
	1	1		1	
	1			1	
	1	1		1	
	1			1	
	1			1	
1	1	1			
	1			1	
	1			1	
1	1	1			
1	1	1			
1	1				
1	1	1		1	

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1	4	1	6		
1	3		4		
1	5	1	7	1	
1	2		3		
1	4		5	1	
1	4		5	1	
2	5	1	8		
2	5		7		
	3	1	4	3	
1	4	1	6		
1	5		6	1	
1	8	1	10	1	
1	4		5	1	
1	8	1	10	1	
1	4	1	6		
2	5		7		
1	8	1	10	1	
1	5	1	7	1	
1	5		6	1	
2	5		7		
1	4		5	1	
1	3		4		
2	5		7		
1	5	1	7	1	
1	3		4		
2	2		4		
	1	1	2		
	3	2	5	3	
1	4	1	6		
1	8	1	10	1	

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
		2	4		
1	1	1	2	3	0
	1	1	4	1	0
		3	2	3	0
1	2	2	1	3	0
1	2	4	1	3	0
		6	2		
2	2	1	2	1	0
	3	3	1	6	0
		3	2	1	0
2	3	1	2	3	0
	1	3	1		
1	2	3	1	2	0
1	2	4	1	3	0
		2	3	1	0
1	1	1	3		
1	2	1	3	2	0
	1	1	4	1	0
1	2	1	3	2	0
2	2	1	2	1	0
1	2	3	1	2	0
3	3	1	2	3	0
1	1	3	2	1	0
	1	1	3	2	0
3	3		3	3	0
2	2	3	2	3	0
		6	0	6	0
	3	4	1	5	0
			4	2	0
1	2	3	2	3	0

O	X	LR
Tot	Tot	First
6	0	[OO]
3	3	[XX]
5	1	[XO]
5	3	[XO]
3	3	[XX]
5	3	[OX]
8	0	[OO]
3	1	[OX]
4	6	[XO]
5	1	[XO]
3	3	[XX]
4	0	[XO]
4	2	[OO]
5	3	[OX]
5	1	[XO]
4	0	[OX]
4	2	[XO]
5	1	[XX]
4	2	[XX]
3	1	[OX]
4	2	[OX]
3	3	[OX]
5	1	[OX]
4	2	[XX]
3	3	[OX]
5	3	[OX]
6	6	[XO]
5	5	[XO]
4	2	[XX]
5	3	[XX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1a2 [DDR	4/9/92	11:53 PM	6	VL	vc
gmb1a2 [DDR	4/9/92	11:55 PM	7	VL	vc
gmb1a2 [DDR	4/9/92	11:57 PM	5	VL	vc
gmb1a2 [DDR	4/9/92	11:59 PM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:01 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:03 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:05 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:07 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:09 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:11 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:13 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:15 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:17 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:19 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:21 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:24 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:26 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:28 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:30 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:32 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:34 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:36 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:38 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:40 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:42 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:44 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	12:46 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:48 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:51 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:53 AM	7	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	11	11	1	2
0	0	11	11	1	2
0	0	11	11	1	0
0	0	11	11	1	0
0	0	11	11	1	2
0	0	11	11	1	1
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	1	2
0	0	11	11	1	0
0	0	11	11	1	2
0	0	11	11	1	1
0	0	11	11	2	0
0	0	11	11	1	2
0	0	11	11	1	2
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	1	2
0	0	11	11	1	2
0	0	11	11	2	0
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	1	1
0	0	11	11	1	0
0	0	11	11	1	1
0	0	11	11	1	2
0	0	11	11	1	1
0	0	11	11	1	0
0	0	11	11	2	1
				33	31
				1.1	1.03333333
				0.30512858	0.80871688

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
		1			2
	1			2	
1			0		
1			0		
		1			2
	1			1	
1			0		
	1			1	
	1			1	
		1			2
	1			0	
		1			2
1			1		
2			0		
	1			2	
		1			2
	1			0	
	1			1	
		1			2
		1			2
	2			0	
	1			1	
	1			1	
		1			1
1			0		
	1			1	
	1			2	
1			1		
1			0		
	2			1	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0	1			1	
0	1			1	
0	1			0	
0	1			0	
0	1			1	
0	1			1	
0	1			0	
0	1			1	
0	1			0	
0	1			1	
0	1			0	
0	1			1	
0	1			0	
1	1			0	
0	1			1	
0	1			1	
0	1			0	
0	1			1	
0	1			1	
0	1			1	
1	1			0	
0	1			1	
0	1			1	
0	1			0	
0	1			0	
0	1			1	
0	1			1	
0	1			1	
0	1			0	
1	1			0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
1			1		1
1			1		
0			1		1
0			1		1
1			1		
0			1		
0			1		1
0			1	1	1
1			1		1
1			1		
0			1	1	1
1			1		
1			1		1
0		1	1		1
1			1		1
1			1		1
0			1	1	1
0			1	1	1
1			1		
1			1		
0		1	1	1	1
0			1		1
0			1	1	1
1			1		1
0			1		1
0			1	1	1
1			1		
0			1	1	1
0			1	1	1
1		1	1		1

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
1		1			1
1		1	1		1
				1	1
				1	1
1		1			1
1			1		1
				1	1
1					1
		1		1	1
1		1	1		1
				1	1
1		1			1
		1		1	1
				1	1
1		1			1
1		1			1
				1	1
1					1
1		1	1		1
1		1			1
				1	1
1					1
1					1
		1		1	1
				1	1
1					1
1		1			1
1					1
				1	1
		1		1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
	1	1		1	
		1		1	1
1	1	1		1	
1	1	1		1	
	1	1		1	1
1		1		1	1
1	1	1		1	
1	1	1			
	1	1		1	
		1		1	1
1	1	1			
	1	1		1	1
	1	1		1	
1	1			1	
	1	1		1	
	1	1		1	
1	1	1			
1	1	1			
		1		1	1
	1	1		1	1
1	1				
1	1	1		1	
1	1	1			
	1	1		1	
1	1	1		1	
1	1	1			
	1	1		1	1
1	1	1			
1	1	1			
	1			1	

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
	4		4	2	
	1		1	2	
1	8	1	10	1	
1	8	1	10	1	
	4		4	2	
	2		2	2	1
1	8	1	10	1	
	4	1	5	2	
1	5		6	1	
	3		3	2	
1	4	1	6	1	
	4		4	2	
1	2		3	1	
1	4	1	6		
	4		4	2	
	4		4	2	
1	2	1	4	1	
	4	1	5	2	
	3		3	2	
	3		3	2	
1	1	1	3		
	5	1	6	2	
	4	1	5	2	
1	4		5	1	
1	8	1	10	1	
	4	1	5	2	
	4		4	2	
	6	1	7	2	
1	4	1	6	1	
1	4		5		

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
1	3	2	0	2	0
2	4	4	0	6	0
1	2	2	0		
1	2	2	0		
2	4	1	0	3	0
	3	2	0	4	0
1	2	2	0		
	2	1	0	1	0
2	3	1	0	1	0
3	5			4	0
	1	4	0	2	0
2	4	1	0	3	0
1	2	3	0	5	0
1	1	5	0	1	0
1	3	1	0	3	0
1	3	2	0	2	0
	1	6	0	4	0
	2	1	0	1	0
2	4	1	0	5	0
1	3	1	0	3	0
		6	0	2	0
1	3	1	0	3	0
	2	1	0	1	0
2	3	2	0	2	0
1	2	2	0		
	2	1	0	1	0
2	4	1	0	5	0
	2	4	0	2	0
	1	6	0	2	0
2	2	4	0	2	0

O	X	LR
Tot	Tot	First
2	2	[XX]
4	6	[XO]
2	0	[OO]
2	0	[OO]
1	3	[XX]
2	4	[XO]
2	0	[OO]
1	1	[XO]
1	1	[OX]
0	4	[XX]
4	2	[XO]
1	3	[XX]
3	5	[OO]
5	1	[OO]
1	3	[XO]
2	2	[XX]
6	4	[XO]
1	1	[XO]
1	5	[XX]
1	3	[XX]
6	2	[XO]
1	3	[XO]
1	1	[XO]
2	2	[XX]
2	0	[OO]
1	1	[XO]
1	5	[OX]
4	2	[OO]
6	2	[OO]
4	2	[OX]

				O	O
Game		Game		Missions	
ID	Date	Time	Turn	M1	M2
gmb1a2 [DDR	4/10/92	12:55 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	12:57 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	12:59 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:02 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:04 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:06 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:08 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:10 AM	5	VL	vc
gmb1a2 [DDR	4/10/92	1:12 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:14 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:17 AM	8	VL	vc
gmb1a2 [DDR	4/10/92	1:19 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:21 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:23 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:25 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:27 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:30 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:32 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:34 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:36 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:38 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:40 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:42 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:45 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:47 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:49 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:51 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:53 AM	6	VL	vc
gmb1a2 [DDR	4/10/92	1:55 AM	7	VL	vc
gmb1a2 [DDR	4/10/92	1:58 AM	6	VL	vc

O	O	X	X	X	X
		Missions			
M3	M4	M1	M2	M3	M4
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *
* *	* *	VL	vr	* *	* *

OL	OR	XL	XR	O	X
Player Delay				Score	
TAC	TAC	TAC	TAC	Total	Total
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	0
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	2	0
0	0	111	111	1	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	1	2
0	0	111	111	2	1
0	0	111	111	1	0
0	0	111	111	1	2
0	0	111	111	2	0
0	0	111	111	1	0
0	0	111	111	2	0
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	2	1
0	0	111	111	1	1
0	0	111	111	1	2
0	0	111	111	1	1
0	0	111	111	1	1
0	0	111	111	2	1
0	0	111	111	1	1
				42	27
				1.4	0.9
				0.49827288	0.54772256

O	O	O	X	X	X
Score [first conflict win by team]					
[OO]	[Mix]	[XX]	[OO]	[Mix]	[XX]
1			1		
	1			1	
	1			1	
	1			0	
		1			1
	1			1	
2			0		
	1			1	
2			1		
2			1		
	2			1	
		1			1
	1			1	
		1			2
	2			1	
	1			0	
		1			2
2			0		
	1			0	
	2			0	
		2			1
	2			1	
	2			1	
2			1		
	1			1	
		1			2
		1			1
	1			1	
	2			1	
	1			1	

O	O	O	O	X	X
	Scoring by Mission Areas				Scoring by Miss
ML	MC	MR	MO	ML	MC
0	1			0	
0	1			1	
0	1			0	
0	1			0	
0	1			0	
0	1			1	
1	1			0	
0	1			0	
1	1			0	
1	1			0	
1	1			0	
0	1			0	
0	1			0	
0	1			1	
1	1			0	
0	1			0	
0	1			1	
1	1			0	
0	1			0	
1	1			0	
1	1			0	
1	1			0	
1	1			0	
1	1			0	
0	1			1	
0	1			1	
0	1			0	
0	1			1	
1	1			0	
0	1			0	

X	X	O	O	O	O
sion Areas			Scoring by Victory		
MR	MO	VL	VC	VR	VO
1			1		1
0			1	1	1
1			1		1
0			1		1
1			1		1
0			1	1	1
0		1	1	1	1
1			1		1
1		1	1		1
1		1	1		1
1		1	1		1
1			1		
1			1		1
1			1		
1		1	1		1
0			1		1
1			1		1
0		1	1	1	1
0			1	1	1
0		1	1	1	1
1		1	1		1
1		1	1		1
1		1	1		1
1		1	1		1
0			1	1	1
1			1		1
1			1		
0			1		
1		1	1		1
1			1		

X	X	X	X	O	O
	Scoring by Victory				Scoring by Sur
VL	VC	VR	VO	SL	SC
		1		1	1
1					1
		1		1	1
				1	1
		1		1	1
1					1
				1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
1		1	1		1
		1		1	1
				1	1
1		1			1
				1	1
				1	1
				1	1
		1		1	1
		1		1	1
		1		1	1
		1		1	1
1					1
1		1			1
		1	1	1	1
1					1
		1		1	1
		1		1	1

O	O	X	X	X	X
vival			Scoring by Survival		
SR	SO	SL	SC	SR	SO
	1	1		1	
1	1	1			
	1	1		1	
1	1	1		1	
	1	1		1	
1	1	1			
1	1				
	1	1		1	
	1			1	
	1			1	
	1			1	
	1	1		1	1
	1	1		1	
		1		1	1
	1			1	
1	1	1		1	
	1	1		1	
1	1				
1	1	1			
1	1				
	1			1	
	1			1	
	1			1	
	1			1	
1	1	1			
	1	1		1	
		1		1	1
1	1	1		1	1
	1			1	
	1	1		1	1

O	O	O	O	X	X
	Scoring by TTTs				Scoring by TTT
TL	TC	TR	TO	TL	TC
1	5		6	1	
	4	1	5	2	
1	4		5	1	
1	4	1	6	1	
1	5		6	1	
	5	1	6	2	
1	4	1	6		
1	5		6	1	
2	5		7		
2	5		7		
1	5		6		
1	2		3	1	
1	5		6	1	
	3		3	2	
1	4		5		
1	2		3	1	
	4		4	2	
1	8	1	10		
1	5	1	7	1	
1	4	1	6		
1	3		4		
1	2		3		
1	2		3		
2	2		4		
	5	1	6	2	
	4		4	2	
1	2		3	1	
	3	1	4	2	1
2	5		7		
1	2		3	1	

X	X	O	O	X	X
s			Conflicts Won		
TR	TO	Same	LIFO	Same	LIFO
2	3	1	1	2	0
	2	4	1	3	0
1	2	1	2	1	0
1	2	3	2	3	0
2	3		3	3	0
	2	3	0	1	0
		4	2		
2	3		1	1	0
2	2	2	2	2	0
1	1	2	2		
1	1	1	5	2	0
2	3	2	2	4	0
1	2		3	1	0
3	5			4	0
2	2	2	1	3	0
	1	3	2	3	0
1	3	2	0	2	0
		4	2		
	1	1	3		
		2	4		
1	1	1	2	3	0
2	2	2	0	2	0
1	1	3	2	3	0
1	1	4	2	2	0
	2	3	0	1	0
1	3	2	0	2	0
3	4			4	0
1	4	2	1	3	0
2	2	3	2	3	0
2	3	2	0	4	0

O	X	LR
Tot	Tot	First
2	2	[OO]
5	3	[XO]
3	1	[OX]
5	3	[XO]
3	3	[XX]
3	1	[XO]
6	0	[OO]
1	1	[OX]
4	2	[OO]
4	0	[OO]
6	2	[XO]
4	4	[XX]
3	1	[XO]
0	4	[XX]
3	3	[OX]
5	3	[XO]
2	2	[XX]
6	0	[OO]
4	0	[XO]
6	0	[XO]
3	3	[XX]
2	2	[OX]
5	3	[XO]
6	2	[OO]
3	1	[XO]
2	2	[XX]
0	4	[XX]
3	3	[XO]
5	3	[OX]
2	4	[OX]

APPENDIX H

- A GLM was calculated on the different parameters of the automated experiment.

```
MTB > GLM C6=C3 C4 C5 C3*C4 C3*C5

Factor    Levels Values
TRTMISS        2      1      2
TD             2      0      1
A/C            2      0      1

Analysis of Variance for TRTSCORE

Source         DF     Seq SS     Adj SS     Adj MS       F
P
TRTMISS         1     0.5333     0.5333     0.5333    1.31
.253
TD              1     7.5000     7.5000     7.5000   18.45
.000
A/C             1     0.0000     0.0000     0.0000    0.00
0.000
TRTMISS*TD      1     0.0083     0.0083     0.0083    0.02
0.886
TRTMISS*A/C     1     2.4083     2.4083     2.4083    5.92
0.015
Error         474   192.6750   192.6750     0.4065
Total         479   203.1250

Unusual Observations for TRTSCORE

Obs. TRTSCORE       Fit Stdev.Fit  Residual   St.Resid
 49   2.00000   0.57917   0.07128   1.42083      2.24R
 59   2.00000   0.57917   0.07128   1.42083      2.24R
109   2.00000   0.72083   0.07128   1.27917      2.02R
229   2.00000   0.65417   0.07128   1.34583      2.12R
338   2.00000   0.65417   0.07128   1.34583      2.12R
343   2.00000   0.65417   0.07128   1.34583      2.12R
348   2.00000   0.65417   0.07128   1.34583      2.12R
358   2.00000   0.65417   0.07128   1.34583      2.12R
434   2.00000   0.72083   0.07128   1.27917      2.02R
437   2.00000   0.72083   0.07128   1.27917      2.02R
446   2.00000   0.72083   0.07128   1.27917      2.02R
R denotes an obs. with a large st. resid.
```

- Mann-Whitney Confidence Interval and Test of automated treatment team's score with and without tactical delay.

```
MTB > mann-whitney c11 c12

C11             N = 240    Median =      1.0000
C12             N = 240    Median =      1.0000
Point estimate for ETA1-ETA2 is        - 0.0000
95.0 pct c.i. for ETA1-ETA2 is (-0.0000,-0.0000)
W = 63337.5
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at
0.0002
The test is significant at 0.0000  (adjusted for ties)
```

- A correlation was calculated between tactical delay and treatment team's score.

```
MTB > CORR C4 C6
Correlation of TD and TRTSCORE = -0.192
```

- A correlation was calculated between (treatment team's mission and area/communication delay) and treatment team's score.

```
MTB > CORR C3*C5 C6
        TRTMISS      A/C
A/C       0.000
TRTSCORE  0.051    0.000
```

- Calculation of the overall means of automated and student game scores. Treatment and control team scores are put together.

```
MTB > unstack c8 c13 c14;
SUBC> subs c10.
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO(T)      480
    C12        STUD(T)       75
    C13        AUTO(C)      480
    C14        STUD(C)       75
```

Automated treatment and control scores are put together.

```
MTB > stack c11 c13 c15
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO(T)      480
    C12        STUD(T)       75
    C13        AUTO(C)      480
    C14        STUD(C)       75
    C15        AUTO(T+C)    960
```

Student treatment and control scores are put together.

```
MTB > stack c12 c14 c16
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO(T)      480
    C12        STUD(T)       75
    C13        AUTO(C)      480
    C14        STUD(C)       75
    C15        AUTO(T+C)    960
    C16        STUD(T+C)    150
```

The means are calculated.

```
MTB > desc c15

                 N      MEAN    MEDIAN    TRMEAN     STDEV
SEMEAN
C15            960    0.9719    1.0000    0.9688    0.6821
0.0220

               MIN       MAX        Q1        Q3
C15         0.0000    2.0000    1.0000    1.0000

MTB > desc c16

                 N      MEAN    MEDIAN    TRMEAN     STDEV
SEMEAN
C16            150    0.8467    1.0000    0.8284    0.7211
0.0589

               MIN       MAX        Q1        Q3
C16         0.0000    2.0000    0.0000    1.0000
```

- A two sample t-test is performed on the means.

```
MTB > twosample c15 c16

TWOSAMPLE T FOR C15 VS C16
        N      MEAN     STDEV   SE MEAN
C15   960     0.972     0.682     0.022
C16   150     0.847     0.721     0.059

95 PCT CI FOR MU C15 - MU C16: (0.001, 0.249)

TTEST MU C15 = MU C16 (VS NE): T= 1.99  P=0.048  DF=  192
```

- Calculating the mean of treatment team's score: automated vs. student.

```
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO(T)      480
    C12        STUD(T)       75
```

Comparison of means by two sample T-test.

```
MTB > twos c11 c12

TWOSAMPLE T FOR AUTO VS STUD
         N      MEAN     STDEV   SE MEAN
AUTO   480     0.812     0.651     0.030
STUD    75     0.667     0.723     0.083

95 PCT CI FOR MU AUTO - MU STUD: (-0.030, 0.322)

TTEST MU AUTO = MU STUD (VS NE): T= 1.65  P=0.10  DF=  93
```

- Calculating the mean of control team's score: automated vs. student.

```
MTB > unstack c8 c13 c14;
SUBC> subs c10.
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO(T)      480
    C12        STUD(T)       75
    C13        AUTO(C)      480
    C14        STUD(C)       75

Comparison of the means using the two sample T-test.

MTB > twos c13 c14

TWOSAMPLE T FOR C13 VS C14
        N      MEAN     STDEV   SE MEAN
C13   480     1.131     0.676     0.031
C14    75     1.027     0.677     0.078

95 PCT CI FOR MU C13 - MU C14: (-0.062, 0.271)

TTEST MU C13 = MU C14 (VS NE): T= 1.24  P=0.22  DF=  98
```

• Chi-square calculation.

```
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
```

All treatment team scores are divided out into a table by automated or student and by score value. A Chi-square is then calculated.

```
MTB > table c10 c6;
SUBC> chisquare.

  ROWS: S/A     COLUMNS: TRTSCORE

             0         1         2       ALL

   0       155       260        65       480
   1        36        28        11        75
  ALL      191       288        76       555

 CHI-SQUARE =     8.253   WITH D.F. =    2

   CELL CONTENTS --
                  COUNT

MTB > table c10 c8;
SUBC> chisquare.

  ROWS: S/A     COLUMNS: CTLSCORE

             0         1         2       ALL

   0        82       253       145       480
   1        16        41        18        75
  ALL       98       294       163       555

 CHI-SQUARE =     1.562   WITH D.F. =    2

   CELL CONTENTS --
                  COUNT
```

- Determination of means for interaction plot.

Automated treatment score data was broken out by scenario type to determine the mean points to be used in the interaction plot.
(The code numbering is treatment team mission, tactical delay, area/communication delay, control team mission.)

```
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        480
    C2         GAME         480
    C3         TRTMISS      480
    C4         TD           480
    C5         A/C          480
    C6         TRTSCORE     480
    C7         CTLMISS      480
    C8         CTLSCORE     480
    C9         CODE         480
    C10        S/A          480
    C11        1001          30
    C12        1002          30
    C13        1011          30
    C14        1012          30
    C15        1101          30
    C16        1102          30
    C17        1111          30
    C18        1112          30
    C19        2001          30
    C20        2002          30
    C21        2011          30
    C22        2012          30
    C23        2101          30
    C24        2102          30
    C25        2111          30
    C26        2112          30
```

The individual scenarios were then stacked into four groups: mission A, no area/comm delay; mission A, area/comm delay; mission B, no area/comm delay; and, mission B, area/comm delay. The last column number is the empty column into which the scores were stacked.

```
MTB > stack c11 c12 c15 c16 c28
MTB > stack c13 c14 c17 c18 c29
MTB > stack c19 c20 c23 c24 c30
MTB > stack c21 c22 c25 c26 c31
```

```
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        480
    C2         GAME         480
    C3         TRTMISS      480
    C4         TD           480
    C5         A/C          480
    C6         TRTSCORE     480
    C7         CTLMISS      480
    C8         CTLSCORE     480
    C9         CODE         480
    C10        S/A          480
    C11        1001          30
    C12        1002          30
    C13        1011          30
    C14        1012          30
    C15        1101          30
    C16        1102          30
    C17        1111          30
    C18        1112          30
    C19        2001          30
    C20        2002          30
    C21        2011          30
    C22        2012          30
    C23        2101          30
    C24        2102          30
    C25        2111          30
    C26        2112          30
    C28                     120
    C29                     120
    C30                     120
    C31                     120
```

The mean and standard deviation was then calculated for each column.

```
MTB > desc c28 (Mission A, no area/comm delay)

                 N      MEAN    MEDIAN    TRMEAN     STDEV
SEMEAN
C28            120    0.7083    1.0000    0.6759    0.6533
0.0596

               MIN       MAX        Q1        Q3
C28         0.0000    2.0000    0.0000    1.0000
```

```
MTB > desc c29 (Mission A, area/comm delay)

                N     MEAN   MEDIAN   TRMEAN    STDEV
SEMEAN
C29           120   0.8500   1.0000   0.8333   0.6437
0.0588

              MIN      MAX       Q1       Q3
C29        0.0000   2.0000   0.0000   1.0000


MTB > desc c30 (Mission B, no area/comm delay)

                N     MEAN   MEDIAN   TRMEAN    STDEV
SEMEAN
C30           120   0.9167   1.0000   0.9074   0.6161
0.0562

              MIN      MAX       Q1       Q3
C30        0.0000   2.0000   1.0000   1.0000


MTB > desc c31 (Mission B, area/communication delay)

                N     MEAN   MEDIAN   TRMEAN    STDEV
SEMEAN
C31           120   0.7750   1.0000   0.7500   0.6794
0.0620

              MIN      MAX       Q1       Q3
C31        0.0000   2.0000   0.0000   1.0000
```

APPENDIX I

- Determination of individual score distributions by scenario.

Game data was broken out by scenario and by game type (student or automated) and the score percentages calculated.

```
MTB > info

    COLUMN     NAME       COUNT
 A  C1         TEAMS        555
    C2         GAME         555
    C3         TRTMISS      555
    C4         TD           555
    C5         A/C          555
    C6         TRTSCORE     555
    C7         CTLMISS      555
    C8         CTLSCORE     555
    C9         CODE         555
    C10        S/A          555
    C11        AUTO         480
    C12        STUD          75

 CONSTANTS USED: NONE
```

--Break out of treatment scores by scenario and automated or student game type.

```
MTB > table c10 c6 c9;
SUBC> rowp.

  CONTROL: CODE = 1001
  ROWS: S/A     COLUMNS: TRTSCORE

              0        1        2      ALL
   0     43.33    43.33    13.33   100.00
   1     50.00    50.00       --   100.00
  ALL    43.75    43.75    12.50   100.00
```

CONTROL: CODE = 1002
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	13.33	63.33	23.33	100.00
1	50.00	25.00	25.00	100.00
ALL	17.65	58.82	23.53	100.00

CONTROL: CODE = 1011
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	30.00	60.00	10.00	100.00
1	16.67	33.33	50.00	100.00
ALL	27.78	55.56	16.67	100.00

CONTROL: CODE = 1012
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	30.00	36.67	33.33	100.00
1	60.00	--	40.00	100.00
ALL	34.29	31.43	34.29	100.00

CONTROL: CODE = 1101
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	56.67	36.67	6.67	100.00
1	66.67	33.33	--	100.00
ALL	58.33	36.11	5.56	100.00

CONTROL: CODE = 1102
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	46.67	53.33	--	100.00
1	40.00	40.00	20.00	100.00
ALL	45.71	51.43	2.86	100.00

CONTROL: CODE = 1111
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	36.67	60.00	3.33	100.00
1	80.00	20.00	--	100.00
ALL	42.86	54.29	2.86	100.00

CONTROL: CODE = 1112
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	20.00	70.00	10.00	100.00
1	66.67	33.33	--	100.00
ALL	27.78	63.89	8.33	100.00

CONTROL: CODE = 2001
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	3.33	76.67	20.00	100.00
1	--	50.00	50.00	100.00
ALL	3.12	75.00	21.87	100.00

CONTROL: CODE = 2002
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	33.33	53.33	13.33	100.00
1	33.33	66.67	--	100.00
ALL	33.33	54.55	12.12	100.00

CONTROL: CODE = 2011
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	3.33	76.67	20.00	100.00
1	33.33	50.00	16.67	100.00
ALL	8.33	72.22	19.44	100.00

CONTROL: CODE = 2012
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	46.67	33.33	20.00	100.00
1	60.00	20.00	20.00	100.00
ALL	48.57	31.43	20.00	100.00

CONTROL: CODE = 2101
ROWS: S/A COLUMNS: TRTSCORE

	0	1	2	ALL
0	--	86.67	13.33	100.00
1	20.00	80.00	--	100.00
ALL	2.86	85.71	11.43	100.00

```
CONTROL: CODE = 2102
ROWS: S/A     COLUMNS: TRTSCORE

          0        1        2      ALL
 0    56.67    30.00    13.33   100.00
 1    60.00    20.00    20.00   100.00
ALL   57.14    28.57    14.29   100.00

CONTROL: CODE = 2111
ROWS: S/A     COLUMNS: TRTSCORE

          0        1        2      ALL
 0    20.00    66.67    13.33   100.00
 1    16.67    83.33       --   100.00
ALL   19.44    69.44    11.11   100.00

CONTROL: CODE = 2112
ROWS: S/A     COLUMNS: TRTSCORE

          0        1        2      ALL
 0    76.67    20.00     3.33   100.00
 1   100.00       --       --   100.00
ALL   79.41    17.65     2.94   100.00
```

--Break out of control scores by scenario and automated or student game type.

```
MTB > table c10 c8 c9;
SUBC> rowp.

CONTROL: CODE = 1001
ROWS: S/A     COLUMNS: CTLSCORE

          0        1        2      ALL
 0    43.33    30.00    26.67   100.00
 1       --   100.00       --   100.00
ALL   40.62    34.37    25.00   100.00

CONTROL: CODE = 1002
ROWS: S/A     COLUMNS: CTLSCORE

          0        1        2      ALL
 0       --    63.33    36.67   100.00
 1       --    75.00    25.00   100.00
ALL      --    64.71    35.29   100.00
```

CONTROL: CODE = 1011
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	53.33	36.67	10.00	100.00
1	66.67	33.33	--	100.00
ALL	55.56	36.11	8.33	100.00

CONTROL: CODE = 1012
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	--	90.00	10.00	100.00
1	--	80.00	20.00	100.00
ALL	--	88.57	11.43	100.00

CONTROL: CODE = 1101
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	16.67	63.33	20.00	100.00
1	16.67	66.67	16.67	100.00
ALL	16.67	63.89	19.44	100.00

CONTROL: CODE = 1102
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	--	53.33	46.67	100.00
1	20.00	20.00	60.00	100.00
ALL	2.86	48.57	48.57	100.00

CONTROL: CODE = 1111
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	20.00	60.00	20.00	100.00
1	--	60.00	40.00	100.00
ALL	17.14	60.00	22.86	100.00

CONTROL: CODE = 1112
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	--	60.00	40.00	100.00
1	--	66.67	33.33	100.00
ALL	--	61.11	38.89	100.00

CONTROL: CODE = 2001
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	16.67	60.00	23.33	100.00
1	--	50.00	50.00	100.00
ALL	15.62	59.37	25.00	100.00

CONTROL: CODE = 2002
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	36.67	53.33	10.00	100.00
1	100.00	--	--	100.00
ALL	42.42	48.48	9.09	100.00

CONTROL: CODE = 2011
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	13.33	53.33	33.33	100.00
1	50.00	50.00	--	100.00
ALL	19.44	52.78	27.78	100.00

CONTROL: CODE = 2012
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	33.33	46.67	20.00	100.00
1	20.00	80.00	--	100.00
ALL	31.43	51.43	17.14	100.00

CONTROL: CODE = 2101
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	6.67	53.33	40.00	100.00
1	20.00	80.00	--	100.00
ALL	8.57	57.14	34.29	100.00

CONTROL: CODE = 2102
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	16.67	53.33	30.00	100.00
1	40.00	40.00	20.00	100.00
ALL	20.00	51.43	28.57	100.00

CONTROL: CODE = 2111
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	3.33	20.00	76.67	100.00
1	--	50.00	50.00	100.00
ALL	2.78	25.00	72.22	100.00

CONTROL: CODE = 2112
ROWS: S/A COLUMNS: CTLSCORE

	0	1	2	ALL
0	13.33	46.67	40.00	100.00
1	--	25.00	75.00	100.00
ALL	11.76	44.12	44.12	100.00

APPENDIX J

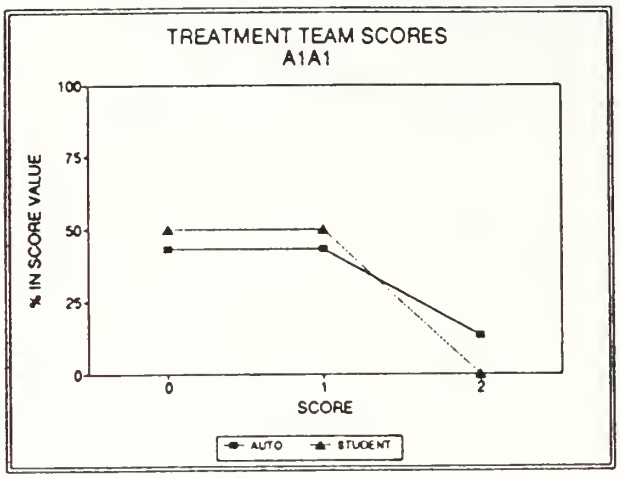


Figure 1

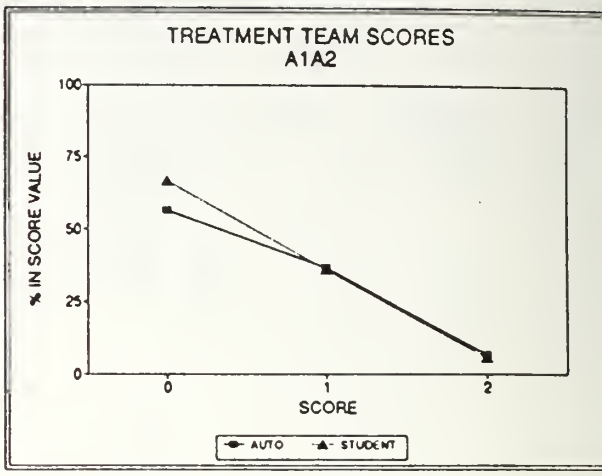


Figure 2

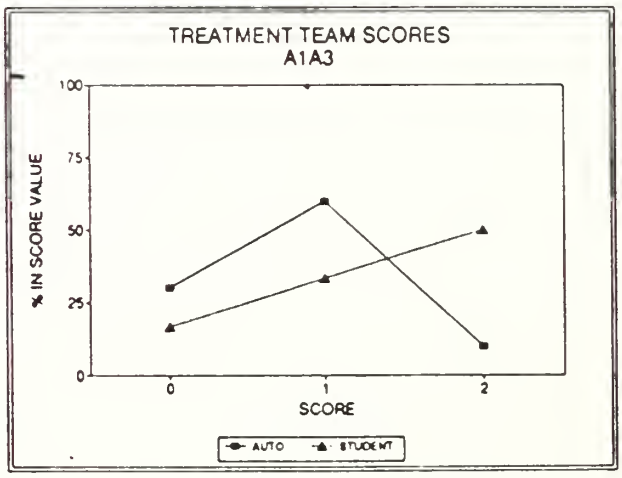


Figure 3

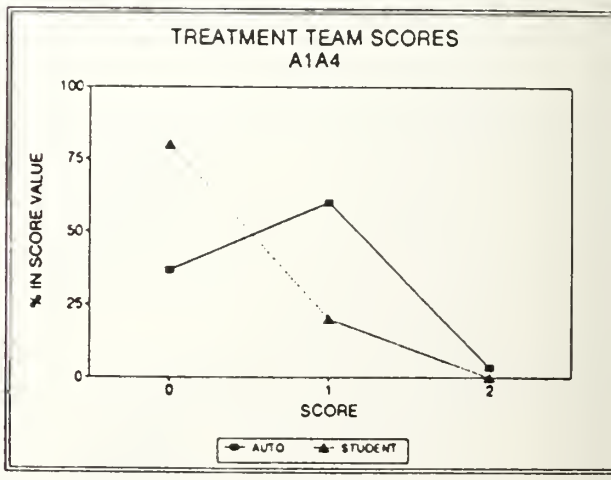


Figure 4

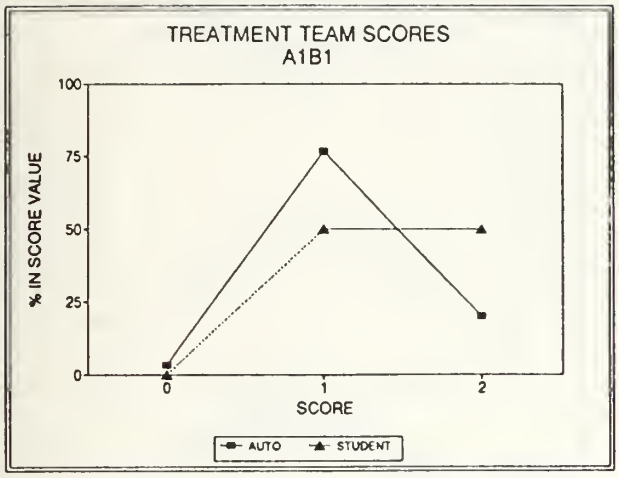


Figure 5

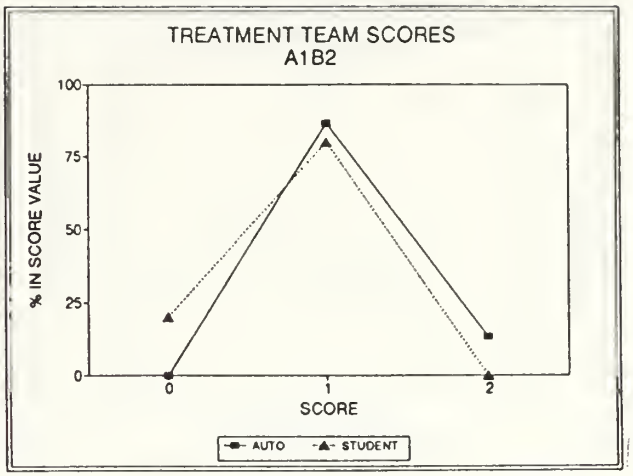


Figure 6

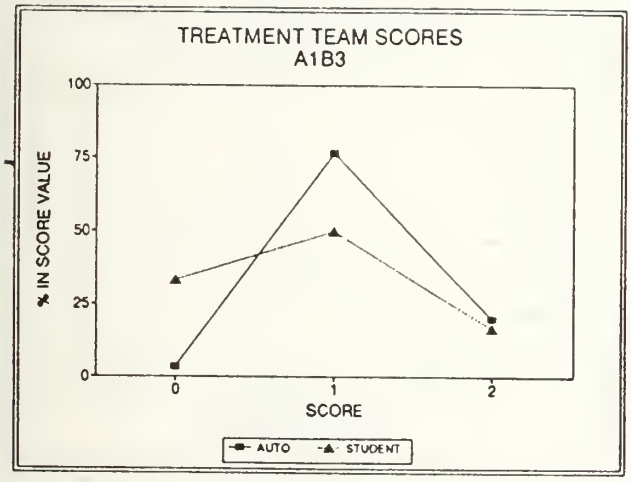


Figure 7

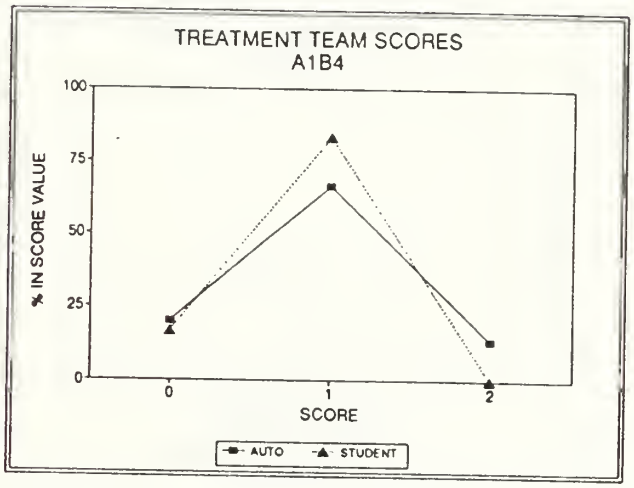


Figure 8

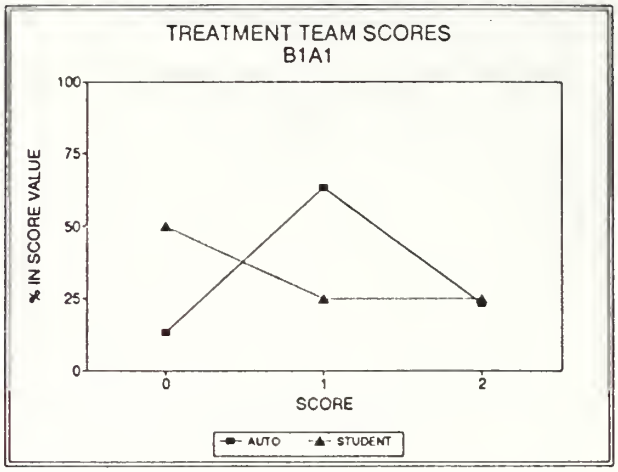


Figure 9

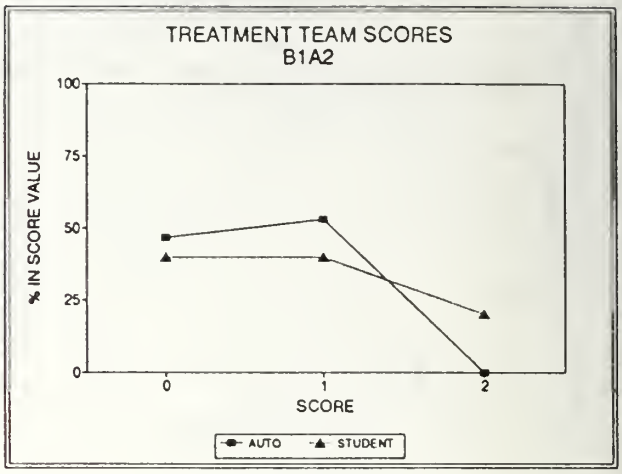


Figure 10

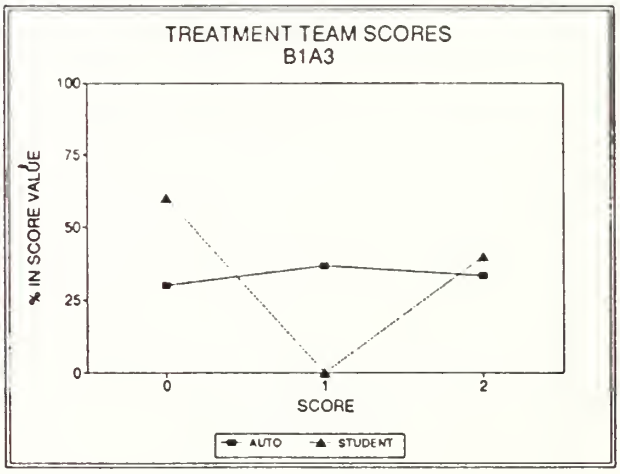


Figure 11

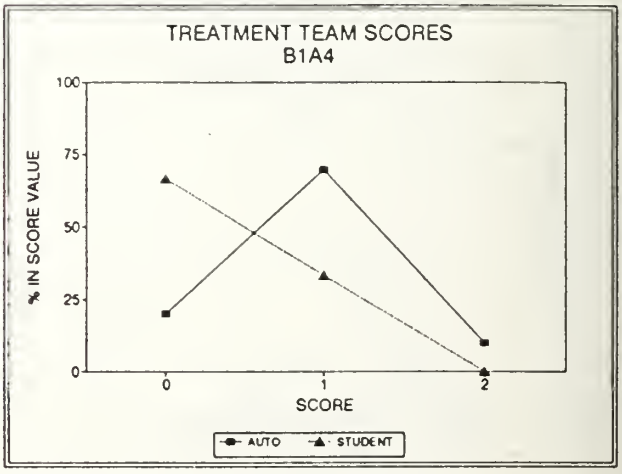


Figure 12

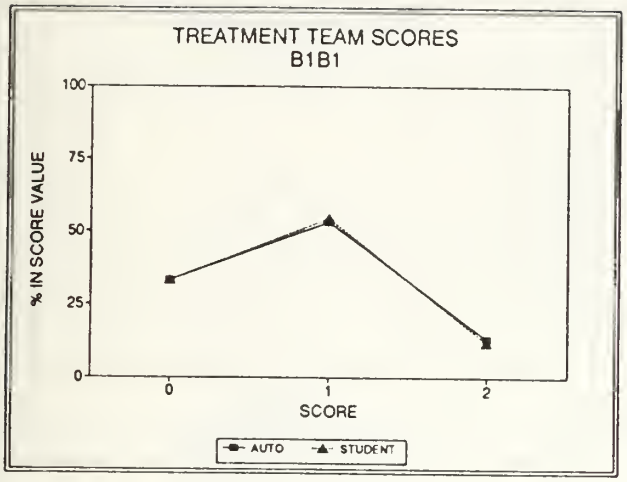


Figure 13

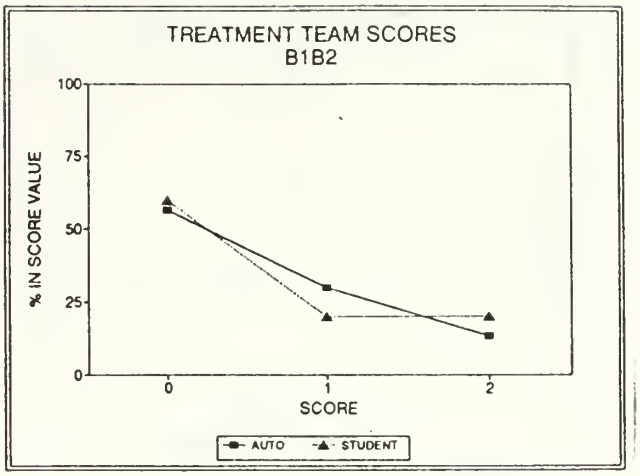


Figure 14

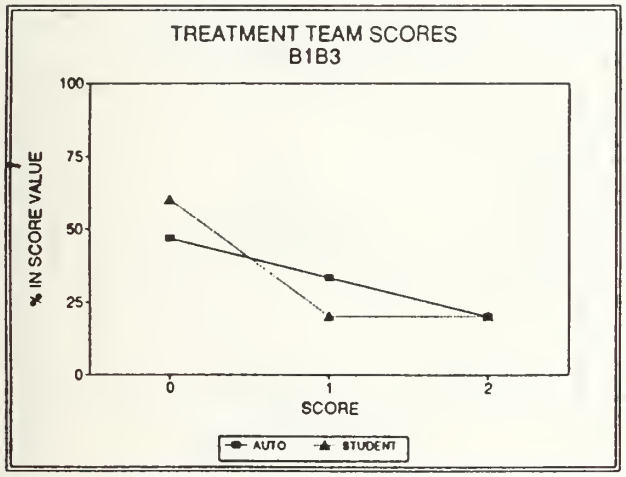


Figure 15

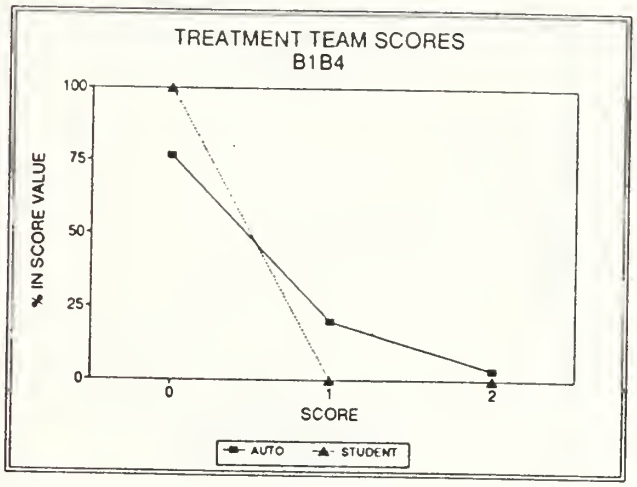


Figure 16

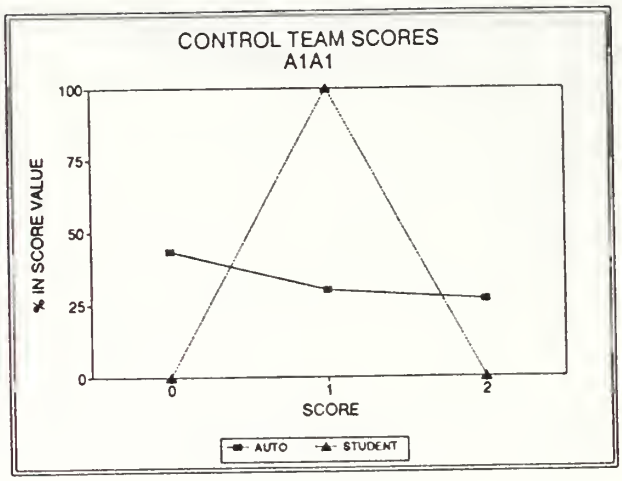


Figure 17

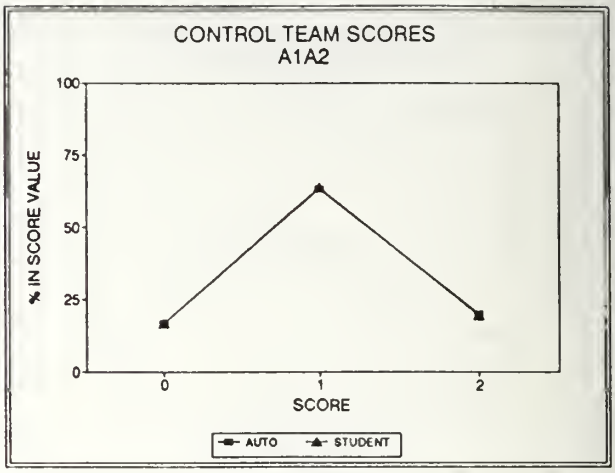


Figure 18

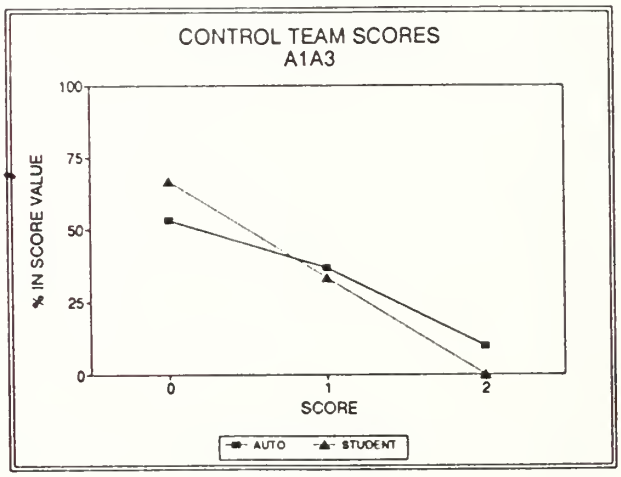


Figure 19

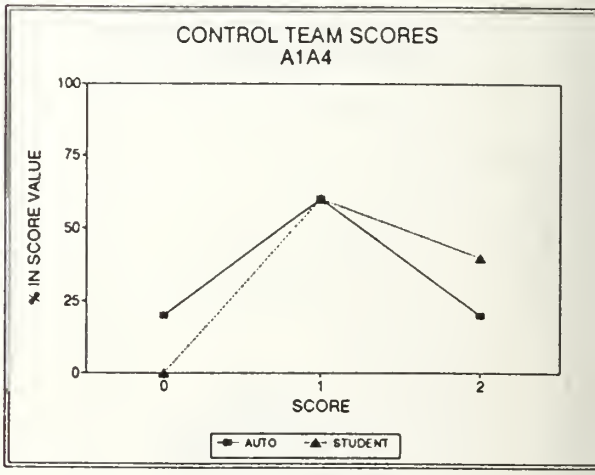


Figure 20

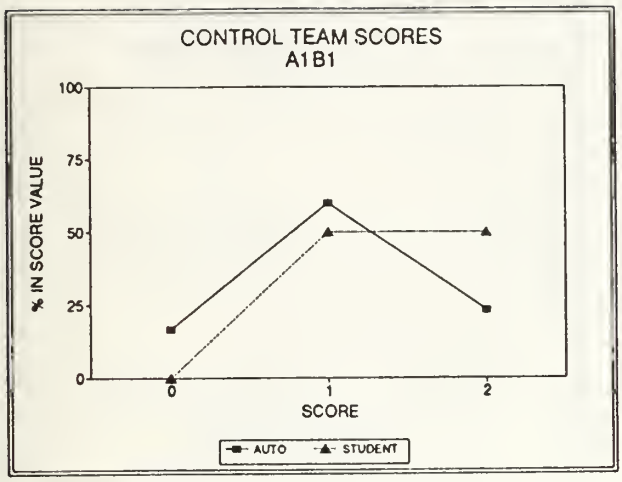


Figure 21

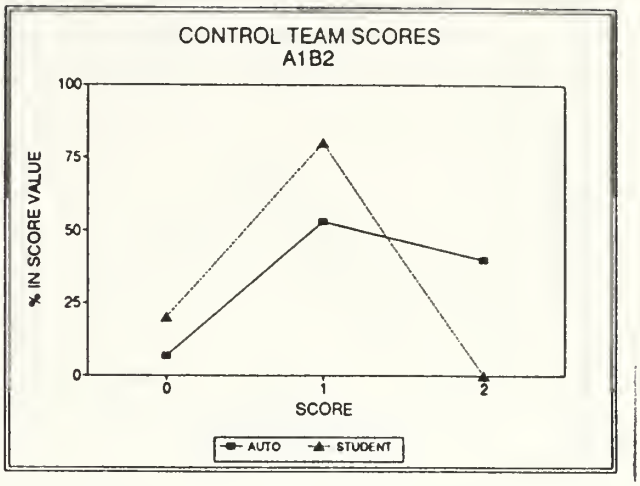


Figure 22

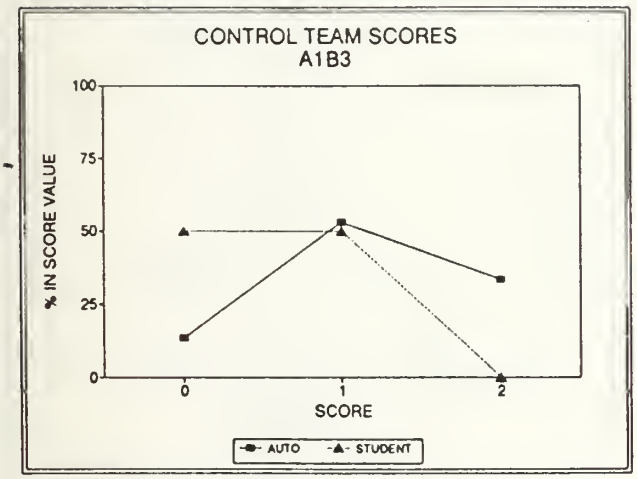


Figure 23

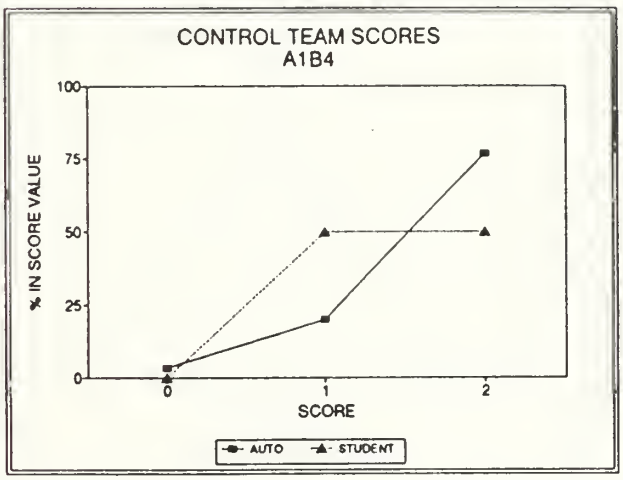


Figure 24

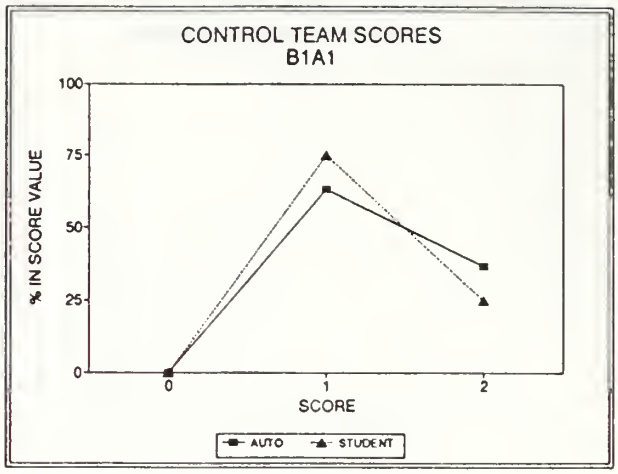


Figure 25

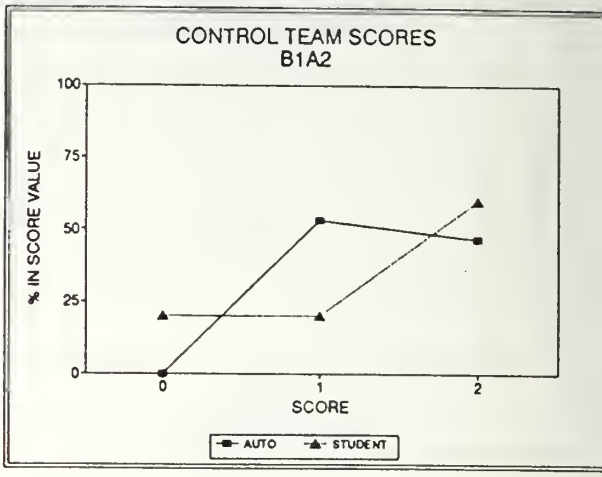


Figure 26

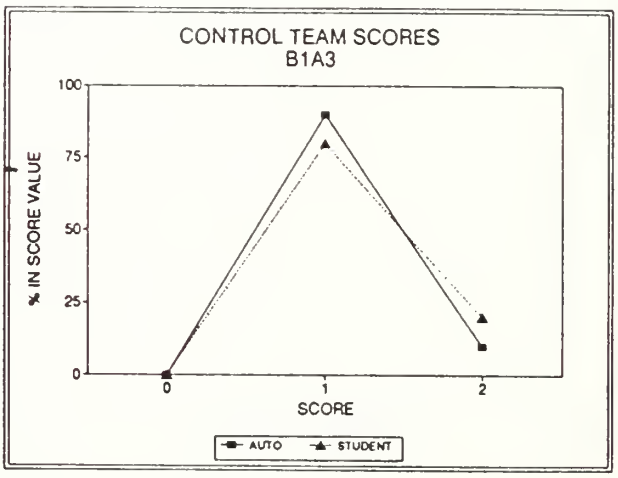
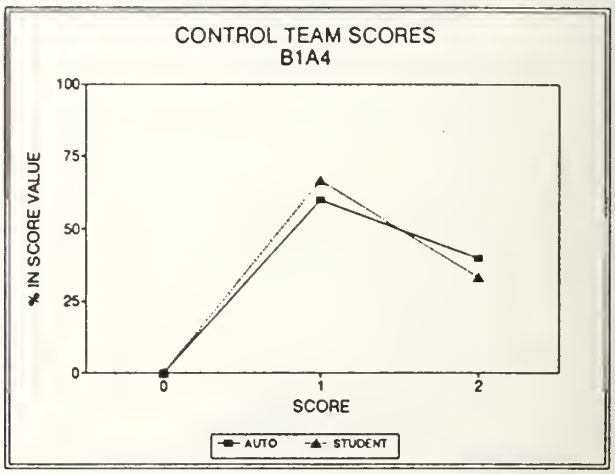


Figure 27



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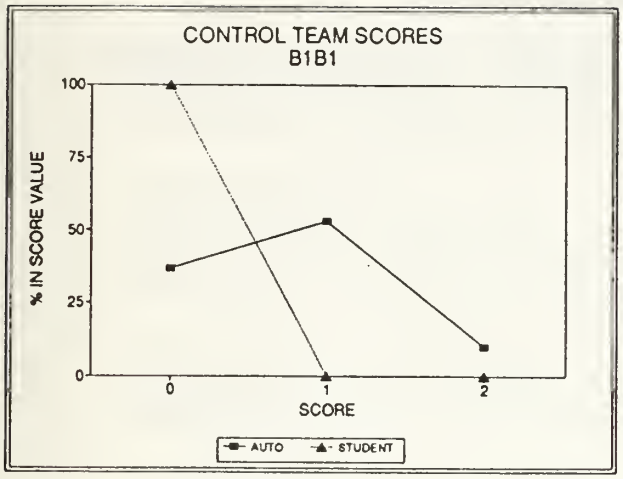

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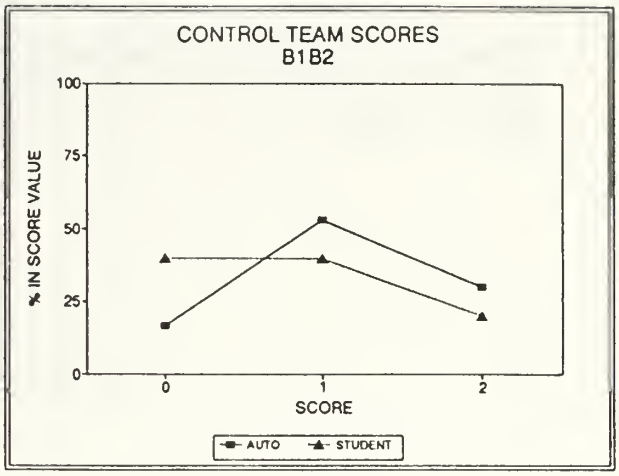

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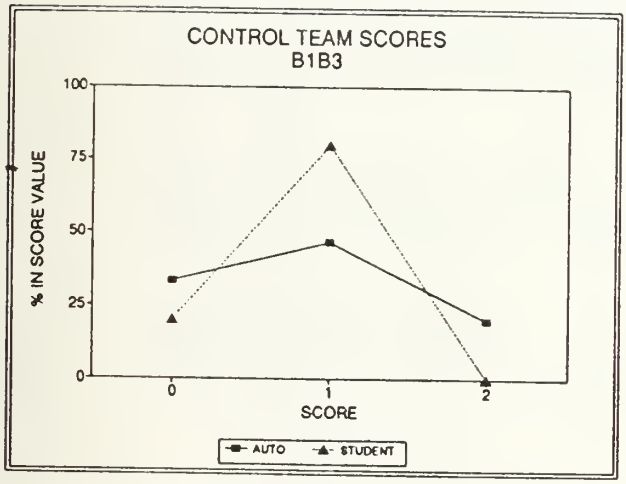

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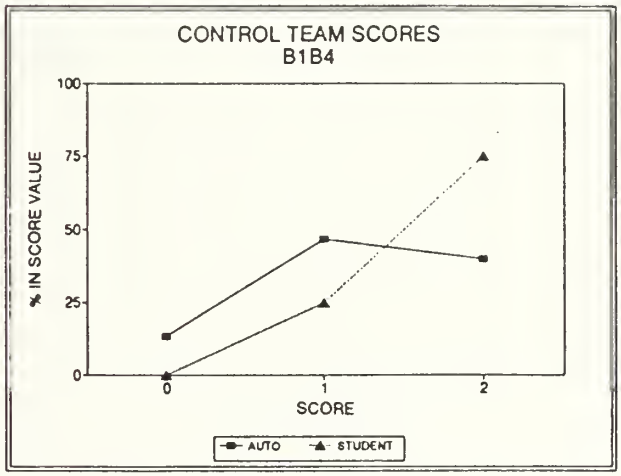

Figure 32

LIST OF REFERENCES

Sherfey, Linda M., *Wargaming in Support of Command, Control and Communications Experiments*, Naval Postgraduate School, March 1992.

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